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TODAYS

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for business?

RSI, the new business
disease —
how to avoid it

Repco consolidates
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Word processors—
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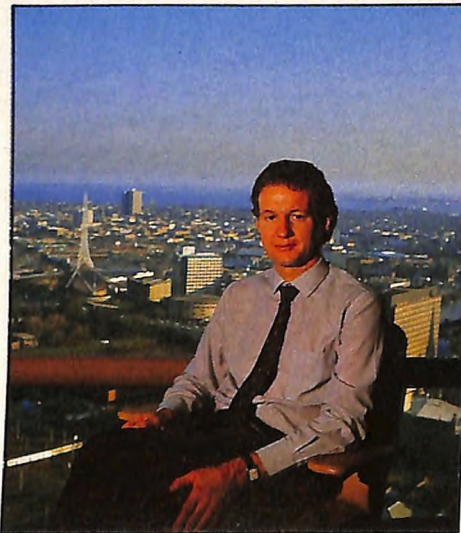
COMPUTERS



Barclays' Ian Minchin: page 24



IBM PC v. Apple Macintosh: page 40



Insurance broker John Clarke: page 73

FEATURES

- 24 Million-dollar transactions at the touch of a key**
How personal computers manage the megabucks of the money managers, the retail and merchant bankers
- 37 Enter the electronic secretary**
Xerox Corporation's artificial intelligence expert foreshadows the pocket secretary
- 38 'Unbundling' is the trend**
John Kavanagh finds bundled software being unbundled by distributors concerned at high prices
- 40 IBM PC v. Apple Macintosh**
Pitting the two popular micros against each other, application for application, this report attempts to determine which is best for business. The results are sure to surprise
- 63 Publisher sees scope for local software**
Fresh from shakeouts in the US software market, Robert Wells tells Pamela Williams that Australia's software industry could boom
- 73 Fighting a \$400 million pain in the arm**
Our exclusive cover story on the real cost of our newest industrial disease — RSI — and how business can avoid it
- 99 A word for all reasons**
We look at the word processing market including dedicated systems and stand-alone and integrated packages

DEPARTMENTS

- 6 Keystrokes** with David Koch
- 8 Business comment** by Robert Gottlieb
- 10 News**
- 23 Competition**
Win one of 10 Roland color monitors valued at \$1275 each
- 66 Information services**
- 69 Education**
- 125 Humor**
Mike McColl Jones on coming to grips with new technology
- 127 Benchtests**
Our experts put new releases through their paces.
- 146 Hardware update**
- 150 Software update**
- 153 Coming up; Advertisers index**
- 154 At random**

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Alice Springs accountant Peter Vroom was the lucky winner from hundreds of entrants in our competition to win a \$5000 Ericsson PC. At right is Ericsson's PC product and marketing manager, Sue Ward, with her on-screen congratulations — Peter's computerised response (below) is: "I would like to convey my sincere thanks to Ericsson personal computers and *Today's Computers* for this magnificent prize."

APPLE

85 Mac software updates

Stewart Fist reports on the latest of a string of new software, including MacWrite 4.5 and Finder 4.1

88 Friendly power

We review a Mac database manager, Omnis 2 — simple yet sophisticated

PC AUSTRALIA

91 Doing it better on a PC

How a \$700 home computer beat a million-dollar mainframe. Peter Young reports

92 Switching printers

Lloyd Borrett's wizard's notebook discusses re-directing your PC to a second printer

95 Risky business

Is the spreadsheet the most accurate alternative to traditional programming, Lloyd Borrett asks

97 Headers and footers

Lotus Talk with Barry Roberts tackles print options under 1-2-3

ACCOUNTANCY

113 Staying afloat in a sea of paper

How Victoria's State Electricity Commission fought the paper war, and won. Tony Thomas reports

114 Flexibility the key

How accountants can ease the burden of new computer users, as told to a Victorian ASA conference

116 New funds package

News of a new lease accounting software facility

119 On Account

Contributing editor Tony Thomas on the accounting trail

121 Consolidations all together

How Repco's 85 operating companies and 500 operation centres use a financial reporting package to consolidate results

122 Growth in security

How Coopers & Lybrand's computer security group keep clients' data safe

NEXT MONTH

Word Processing

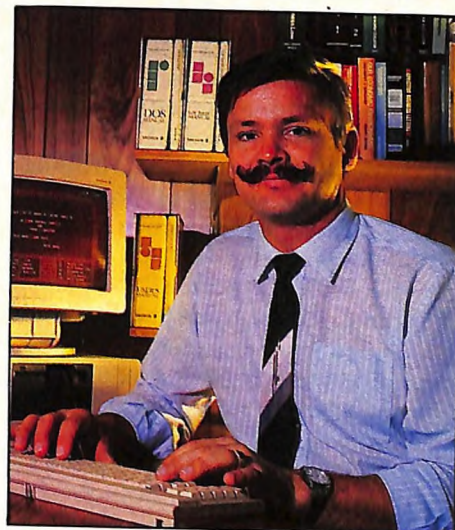
Our exclusive report compares 100 features of the latest offerings, in easy-to-read charts

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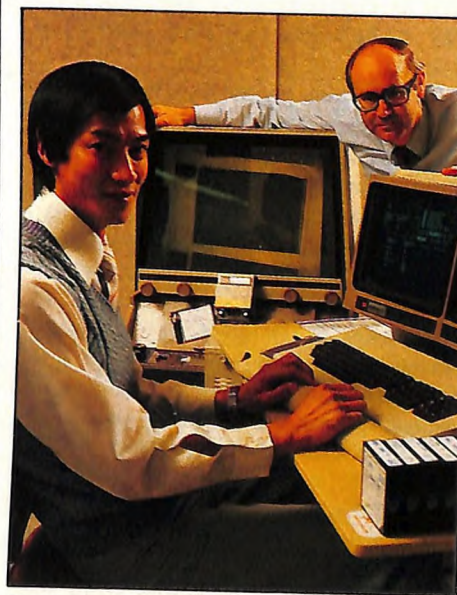
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Ericsson's Sue Ward



Ericsson PC competition winner Peter Vroom



The SEC's David Leong (left) and Ray Diggins: page 113

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KEYSTROKES

Since the arrival of the IBM Personal Computer in Australia three years ago, business has adopted this new technology with great gusto. An industry that literally started in a garage with the tinkering of electronic boffins was suddenly besieged by a legion of businessmen searching for tools to make their operations more efficient and competitive. The personal computer has proved to be a godsend in providing a fast, low-cost means of processing administrative and accounting tasks.

With the proliferation of new business software, the role of personal computers has been extended towards a financial modelling and planning aid, the likes of which the business world had never enjoyed before. In short, personal computers have dramatically changed the way Australian business operates, and have launched tradition-bound executives into the 21st century. The change from personal computers being seen as electronic toys and education aids to business tools has been swift indeed.

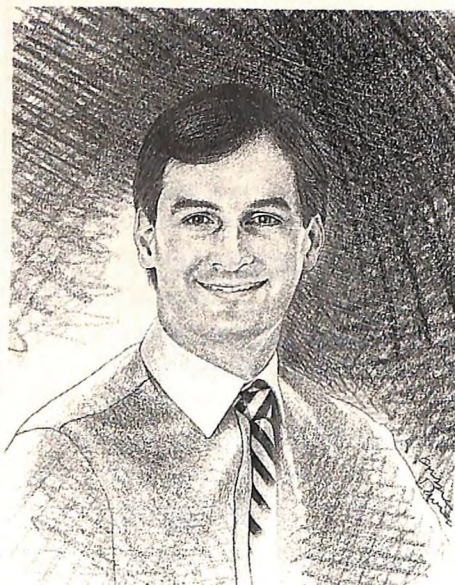
But all along, people have been forced to adapt to computers rather than computers adapt to people. This attitude could jeopardise the developing relationship with business. It is only of late that the new breed of software packages have been developed to suit real-life business procedures. In this area the Apple Macintosh needs to be highly commended for the way in which this machine closely relates to an individual's work environment. But rather than the rule, Macintosh is an exception.

And although software is now progressing down the path of user friendliness, most hardware still has a long way to go. To an outsider it seems that nearly every machine comes from the same mould. Sure, there are some aesthetic differences, but basically most manufacturers are not putting in any effort.

The longer manufacturers resist personalising their machines, the greater the risk of frightening business away; their indecision has sparked a little-known disease that business is now paying for.

Repetitive strain injury (RSI) is a disease that microcomputer manufacturers — and business — are loathe to talk about. But problems created by RSI are real, and are costing industry in this country millions of dollars already. It is a problem that can't be ignored and must be tackled by all concerned. In fact, over the next six months a series of reports from various governments and unions will appear and will inevitably spark formal legislative action.

Everyone knows the effects of RSI, but few know how to combat it. Many businesses have yet to recognise that RSI is a permanent physical problem and not some sort of psychological trauma.



David Koch

David Koch, managing editor

In this issue of *Today's Computers*, editor Graeme Kemlo and his team tackle what I believe to be the most important technology issue of the decade. In our major report on RSI, starting on page 73, we not only discuss the symptoms, but we also speak to a host of experts on how business can reduce the risk of this crippling disease striking their staff. We also reveal how business can recognise the early danger signals.

Reporters Pamela Williams and Helen Grant take business readers through the effects of and solutions to RSI. It is a feature not to be missed by any business using personal computers.

One of the crowning achievements of the Hawke Government has been the massive deregulation of the financial industry. Not only have we seen the floating of the Australian dollar, deregulation of the sharebroking industry and a relaxation of Reserve Bank controls on the monetary system, but the move that will probably have the biggest impact on Australian industry in years to come has been the approval of the swag of new foreign banks.

The decisions for business are critical as they are courted by a host of new banks. Now that the initial flood of publicity has subsided, how these banks will be structured and the services they will offer must be considered.

Central to a new bank's ability to meet the demands of business will be the computer network and facilities set up to help customers. Pamela Williams and Sydney bureau chief John Kavanagh have examined exactly what the existing local banks and newcomers will be doing in the personal computer area to service business customers better. It is an important analysis of an industry that is gearing up for fierce competition, with computers as a front-line weapon.

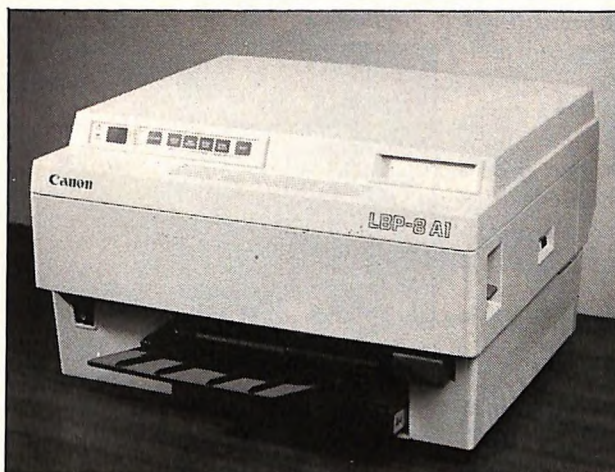
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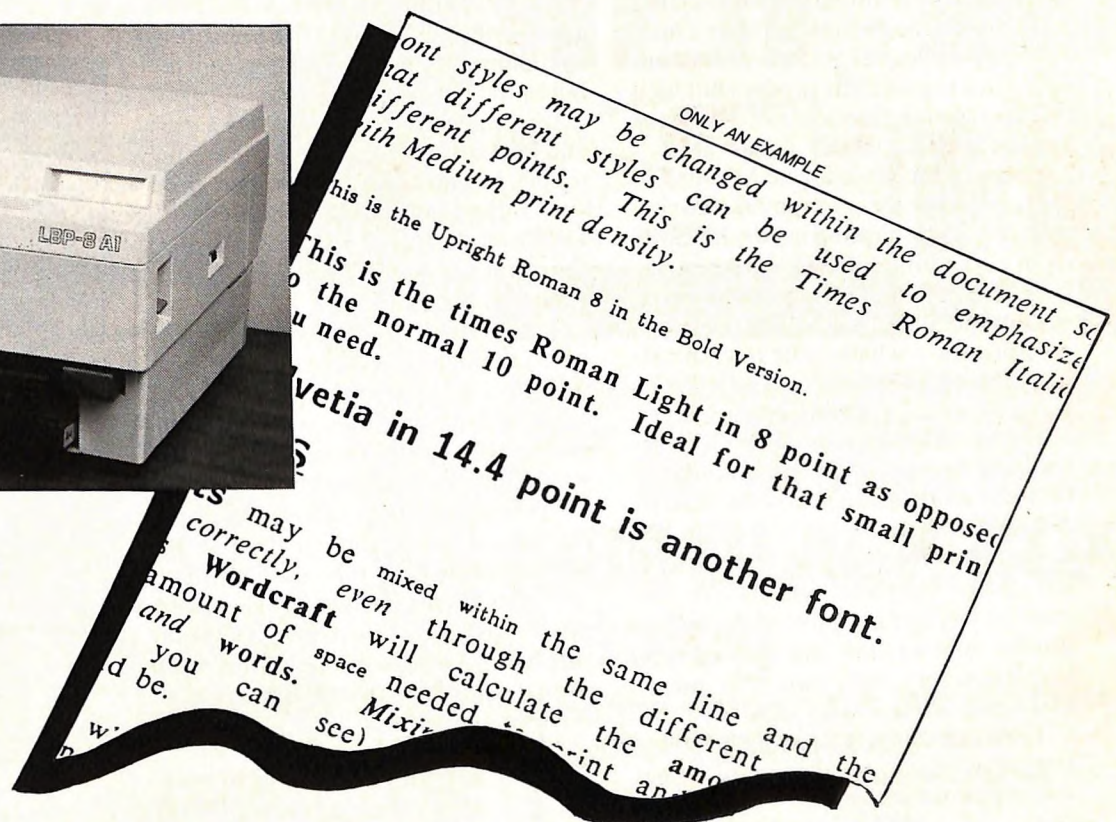
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BUSINESS COMMENT

As the business participants climbed down from the tax summit many of them must have found it very hard to explain to their supporters how they were out-maneuvred.

Many would have been unhappy about the business taxes that were being imposed, such as a capital gains tax, a tax on business cars and the abolition of entertainment deductions. But everyone was told that this was necessary to get union approval for the consumption tax and the consequent fall in income taxes.

Representatives of the professions like the law, accounting and architecture had gone to the summit perhaps a little unhappy about the prospect of a consumption tax on their services but with the knowledge that the tax would be applied widely.

Then, in the wheeling and dealing of the behind-the-scenes negotiations, suddenly the consumption tax disappeared from everything but the service industries. But all the extra business taxes, with the possible exception of the tax on gold profits — which could have threatened three Labor seats in Western Australia — were left firmly in place.

Worse still, emphasis has been diverted from the very real need to convince the trade union movement of the need to discount wage rises for the fall in the dollar. Don't be surprised if in the next few weeks strenuous efforts are not made to increase the value of the dollar. But the only way this can be done is by keeping a very tight monetary policy that keeps interest rates high.

This is of course politically most unattractive but in the absence of a deal with the unions there are few alternatives.

There's a lesson for us all in the latest CSR annual report. Four years ago, CSR bought the Delhi interests in the Cooper Basin. It was about to start negotiating to sell off half the interest when Delhi struck oil in the Jackson field. At the time, everyone thought oil prices would continue to rise and CSR believed that there was great potential for more discoveries.

In fact the oil price declined. In our terms the fall was minimal because of the Australian dollar slump, but unfortunately for CSR, almost all the money borrowed to buy Delhi was in US dollars. So although revenue has gone up more than expected, it has been offset by the currency losses resulting from the fall in the Australian dollar.

CSR put its Delhi interests into a trust and kept them at the back of the annual report, but now admits that there is no such thing as off-balance-sheet entries. Delhi had always been part of CSR, even though it was kept aside from the conventional balance sheet.

The company's mistake was to borrow too much even though it thought it was on a certain winner. If CSR had contained its borrowings, perhaps by selling off a half interest, the company would now be enjoying better times.

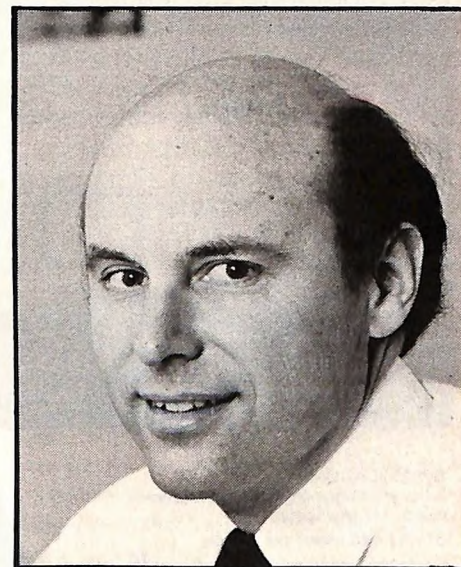
With today's high interest rates the dangers of borrowing to the hilt are much greater than they were 10 to 15 years ago. On the other hand, it is equally dangerous to limit borrowing if it means that your business is operating with capital equipment that is inferior to that of your competitors.

The CSR story is likely to have a happy ending, because the rate of oil discovery in the Cooper

Basin is accelerating as additional knowledge has led geologists to areas once thought to be barren.

The Federal Government must be watching the new discoveries with mixed feelings. At present it is earning about \$3.8 billion a year from Bass Strait taxes. Although the latest discoveries mean that Australia is more likely to maintain self sufficiency in oil into the next decade as Bass Strait starts to decline, this new oil will be taxed at a lower rate.

By 1990 revenue from oil taxes will drop to less than \$1.5 billion, which will mean some hefty new government taxes or a real cut in government expenditure.



Robert Gottlieb

group managing editor

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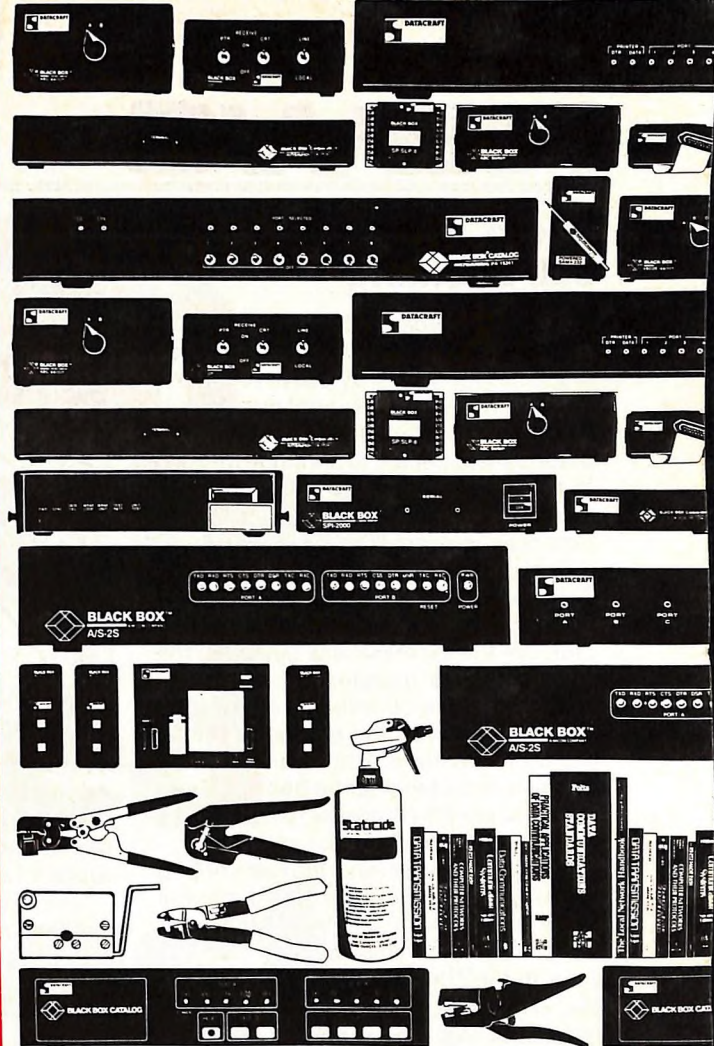
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NEWS

Micro market still booming

The financial year ended on a high note for Australian personal computer dealers. Sales increased by 200 percent over June, and dealers were kept busy in July filling orders. The buoyant trading conditions are expected to continue through to the end of August, when the market may go into a short lull before the Christmas season prompts renewed buying.

Focus Research reports that some dealers increased their June turnover by as much as 500 percent, but says that much of the increase was gained at the cost of dealers' margins.

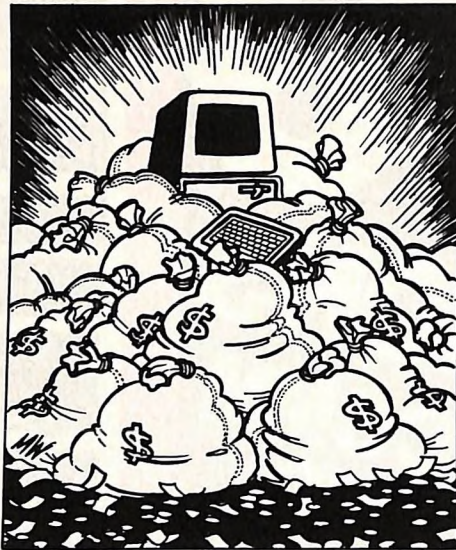
"Discounting contributed to the high sales as much as the ending of the 18 percent investment allowance," says Focus researcher Joanne Booth. "There was a lot of extra pressure to make sales at the end of the financial year."

Parity Computer reported sales of \$4.5 million during June, up from normal sales of around \$3.5 million. Managing director Parry Thomas says many buyers bought their orders forward because of the allowance, but he doubts whether decisions were based solely on the allowance.

Hisoft Australia's Alan Kras does not expect the good result in June to dampen further sales. He expects the market to grow stronger with the release of the IBM PC AT and continued moves towards networking, communications and specialist software.

IBM's strength in the corporate market was unquestioned, with major sales to the banks and other big corporations. The corporate market will expand this year, with Parity already selling 100 IBMs to Budget Rent-a-Car, and new banks and more companies starting to fit microcomputers into their corporate computing plans.

The Federal Government will also be a big buyer this year. The Department of



Administrative Services is reviewing its list of approved microcomputer suppliers, and the new list should spark a round of buying in Canberra.

Jan Pozdena, manager of Amicron, the leading NEC dealer, says that big orders will double in the coming year. But Pozdena will not be ignoring small customers. "For the first time in the PC market we are getting large numbers of second-generation buyers. People replacing their first machines will play a big part in the market this year."

— John Kavanagh

Victoria plans for big IT Month

September is shaping up to be a big month for information technology in Victoria. The first Pan Pacific Computer Conference, with up to five hundred delegates from China, Japan, South-East Asia, the United States and New Zealand, will be held on September 10 to 13.

The conference, jointly sponsored by the Australian Computer Society and

the International Federation of Information Processing, will be six times bigger than any other show held this year and is expected to cover 24,000 square metres of space at the Royal Exhibition Building in Melbourne.

Speakers will include George Conrades, director of IBM World Trade Asia Corp and IBM Japan Ltd, and Dr Kuzzuro Fuchi, director of Japan's Institute for New Generation Computer Technology. A computer exhibition will be held at the same time, ranging from mainframes to microcomputers, peripherals, office automation, communications, software, videotex and word processing.

September is also officially Information Technology Month in Victoria, jointly sponsored by the Federal Department of Industry, Technology and Commerce, the state Department of Industry, Technology and Resources, and the Australian Computer Society.

IT Month will be launched at the Melbourne Concert Hall on Wednesday, September 4 at 8.00 pm. Guest speakers will be the chairman of the Commission for the Future, Phillip Adams, the general secretary of the Amalgamated Metals Foundry and Shipwrights Union, John Halfpenny, columnist Dennis Pryor, and the director-general of the Department of Industry, Technology and Resources, Hans Eisen.

The topic for the forum will be "Are Computers Dehumanising?" The speakers will be questioned by a panel of three journalists, Sally White and Kenneth Davidson from *The Age* and Alan Stokes from 3LO.

Tickets for the forum are available free from Natasha Proctor at the Melbourne office of the Department of Industry, Commerce and Technology on 665 6111. Free copies of the Australian Computer Society's comprehensive directory of non-award computer courses will be distributed at the Concert Hall and throughout IT Month.

— Pamela Williams

Apology to CCL

In the June Issue of *Today's Computers* on page 146 there appears an article titled *Big Blue in the schoolyard* in the *Rumors* section. In this article, there were published statements which may have been taken as meaning that The Computer Shop was operating its business in an unprofitable manner and was experiencing financial difficulties.

Today's Computers has been informed and accepts that this is not the case and apologises for any embarrassment that those statements may have caused The Computer Shop.

Marmaduke also made the statement that a 77 percent interest in The Computer Shop was bought by the New Zealand Andas Group. In fact, a 67 percent interest in The Computer Shop was bought by CCL Group Ltd.

Software shakeout

As the micro industry heads into sharp decline in Britain it has inevitably dragged with it the software and peripherals suppliers. There has been a ruthless weeding out of the legendary rags-to-riches computer games companies.

But when software and peripherals suppliers start dropping, so does advertising revenue. One of the hardest-hit sectors has been the hobbyist maga-

Canon computer judged the best

*See "Showdown
for the Crown" in
June issue of
TODAY'S COMPUTERS.

In a showdown to find the best IBM-Compatible PC, a panel of experts in *Today's Computers** selected Canon from the 12 leading contenders, including IBM.

Here's what the experts had to say about the Canon A-200.

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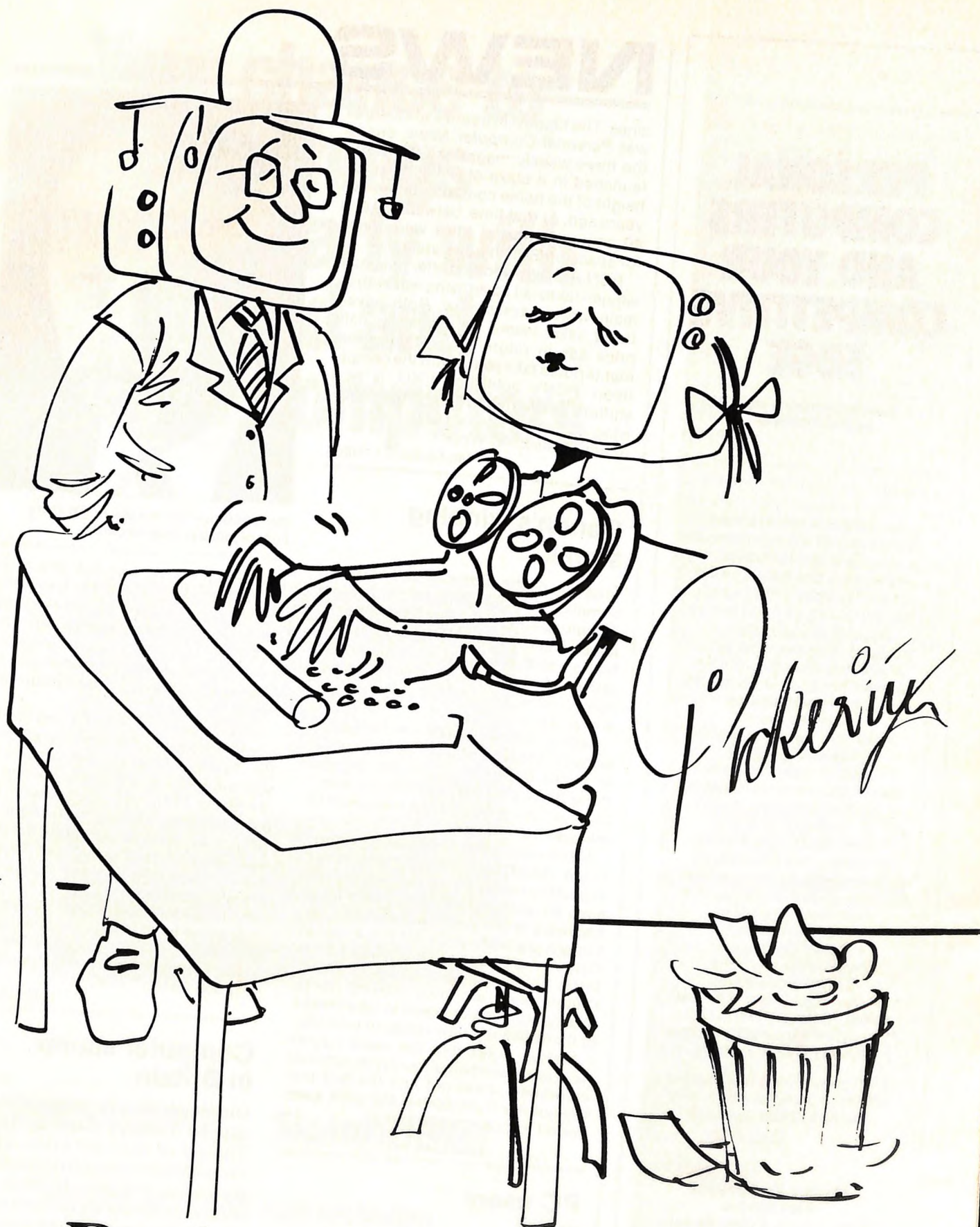
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NEWS

zines. The biggest in a series of closures was *Personal Computer News*, one of the three weekly magazines. PCN was launched in a blaze of publicity at the height of the home computer boom two years ago. At that time, between 30 and 40 computer-related titles were vying for space on British news-stands.

PCN was finally folded after a vicious, winner-takes-all advertising war with its main weekly competitor. Both advertising sales teams were offering half-price ads in return for written agreements not to take space with the competition. PCN's publisher, VNU, is now shifting its attention to the more promising business micro sector, with an offering called *PC Week*.

— Ian Scales in London

Canon's winning streak

Supplies of the Canon A-200 personal computer sold out after its win in *Today's Computers*' ranking of 12 IBM-compatibles. National sales manager Daryl Mahon sold 500 units after the article appeared in June and had to pace the carpet until the next container-loads arrived early in July.

Mahon has increased his budgeted sales for the coming year by 10 percent to about 6000 units. "It's the biggest thing that's ever happened to us here," he says. "We are out to get every inch of mileage that we can."

Mahon says that before the win Canon could readily sell only total systems, especially hardware and software packages for accountants, but now a lot of hardware is being sold separately. Customers are walking in off the street to Canon showrooms and buying, sometimes hardly asking a question. Other Canon lines are also moving more briskly, with dealers keen to take stocks of items like the new range of printers.

Mahon notes that the sales figures have also been helped by the investment allowance phase-out and the fact that the quarter from April is the peak sales period to public accountants.

— Tony Thomas

PC users meet

The Australian Personal Computers Convention (APCON '85) for IBM and compatible users will be held at Sydney's Masonic Centre on September 3-4, 1985. The Australian PC User Group, organ-



Daryl Mahon: "We are out to get every inch of mileage that we can"

iser of the event, says the aim of the conference is to expand the knowledge of PC users. APCON '85 is not a commercial or profit-making exercise, but rather an event staged by PC user groups to bring users together, according to the president of the PC User Group, Ron Pollak.

Guest speakers include Les Bell of Les Bell & Associates, Mark Sneddon of the Australian Computer Graphics Association, Bill Machrone, editor of *PC Magazine* in the US, Don Sayre, IBM representative for South-East Asia, and Bill Lohse of Breakthrough Inc. After each speaker, user group members will demonstrate how they use PCs in their areas of business.

The conference is open to anyone interested in PCs, not just user group members. One day costs \$175, two days \$255. Contact Sheila Philippsohn on (02) 663 3919.

— Helen Grant

Computer slump in Britain

Gloom and despair is the order of the day for Britain's computer industry. The almost daily bad press, reporting the sudden downturn in the manufacturing sector, is making Britain's notoriously conservative money-men nervous. High-tech share prices are slumping.

At the centre of the current bout of concern is Sinclair Research, which has just been rescued by *Daily Mirror* press baron Robert Maxwell. A poor Christ-

NEWS

mas had left Sinclair Research with 20 million pounds of unsold stock, caused largely by a disappointing response to the Sinclair QL.

Sinclair also had to write off 2.5 million against post-Christmas returns and against a necessary price cut on the Spectrum home computer. The resulting lack of cashflow forced Sinclair to default on its creditors and saw the price of Sinclair shares drop from a high of 34 pounds to 5.50.

Earlier this year Acorn was swallowed by Olivetti to stave off the receivers, so the details of the Maxwell takeover bargain came as no surprise. Maxwell's Pergamon Press group now holds a massive 75 percent stake in Sinclair Research, while Sir Clive Sinclair has been left with 20 percent and a non-executive, boffin role more suited to his talents. There are some striking resemblances to the changes in the boardrooms of Apple, where founder Steve Jobs was relieved of executive powers and given a technology-sniffing job.

Optimists see the changes as heralding a new slower-growth era in the market, with large communications and media-oriented companies making strategic purchases in readiness for integration of the various information technologies. But in the short term these dramatic events are steadily shaving pennies off high-technology share prices.

— Ian Scales in London

IBM seeks local software link

IBM plans to enter the local personal computer software market. The company expects to find distributors for more than 100 IBM PC software packages, including its Personal Assistant series, utilities and operating systems.

Discussions with software houses commenced early this year, but no decision has been made. The companies are believed to include Sourceware, Imagineering, Software Corporation of Australia and Arcom Pacific.

Arcom Pacific is tipped to be offered a

distributorship. Arcom's marketing manager, Martin Lack, says: "I think any serious company in Australia who was approached by IBM to see whether they were interested in working closely with IBM would give very serious thought to that opportunity."

Graham Pickels, general manager of Imagineering, sees no reason for his company to vie for a distributorship. "We believe the products we have are the best in the world. There are other distributors that would be more suitable."

— Helen Grant

British suppliers warned

IBM has taken out advertisements warning its British suppliers that unless they improve their track-record on technical development it may have to take its business elsewhere.

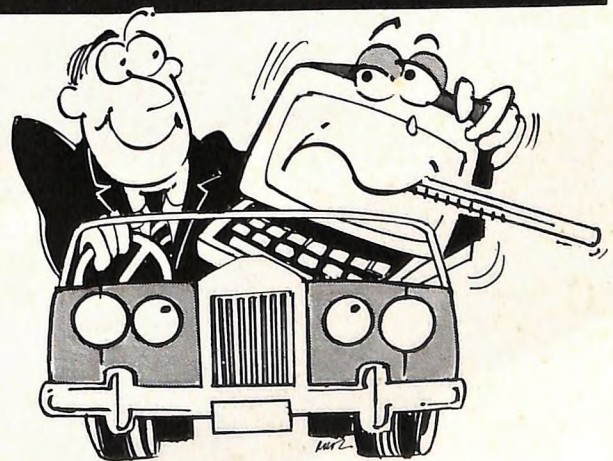
IBM follows the politically prudent policy of manufacturing and buying components in its major markets and until now Britain has been no exception. Conspiracy theorists have hinted that IBM is preparing the ground for a

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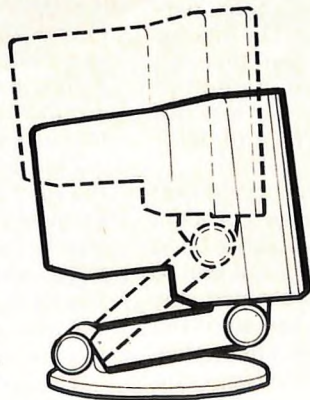
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strategic move of its corporate favors to countries where it wants to boost its market and improve its public relations. But the painful truth is probably that IBM is simply telling it as it is.

According to the chairman of IBM in Britain, Sir Eddie Nixon, local suppliers are failing to capitalise in commercial areas. IBM is concerned that British sources are not moving into the technologies IBM is likely to need to exploit in future, such as advanced optical and magnetic storage technologies and communications products. Although there is a British presence in these sectors, IBM accuses the companies of relying on safe work in aerospace and defence instead of biting the bullet and going out to the market.

This sort of talk is dreadfully familiar, but there is a lot of evidence to suggest that IBM is not simply putting the frighteners on to squeeze its suppliers when the contracts are drawn up. Last year, while IBM's total buying was up 111 per cent, Britain's share rose by only 66 per cent.

— Ian Scales in London

Computer theft increasing

Personal computer theft is rising. In New South Wales, an average of 50 personal computers are stolen each month; in Victoria the figure is between 30 and 40. Most of these thefts take place in the home, but offices, shops and schools have also been hit.

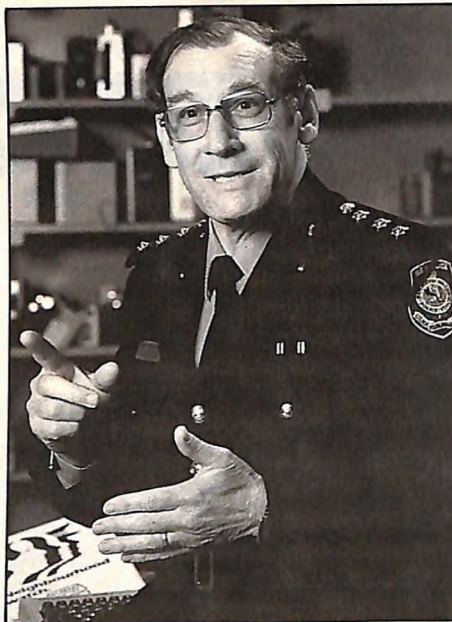
Police figures suggest that the brands most likely to be stolen are Apple, Commodore and IBM, followed by Tandy, Texas Instruments, Dick Smith, Sharp, Atari and NEC.

Computer theft is being encouraged by poor identification of goods, which makes stolen items harder to trace, and by electronic bulletin boards, which list users' names and postal addresses.

Police are taking steps to improve the identification of goods. One problem is that serial identification numbers are often only glued on or can be easily removed with a screwdriver.

Inspector Les Thorgood of the NSW Police Community Relations Bureau says a lot of stolen equipment is found, but if the legal owner of the goods cannot identify them the goods are not returned.

Police departments in NSW, Victoria and Queensland have launched a campaign called "Operation Identification", which is designed to encourage people to properly identify goods with serial numbers or with their drivers' licence



Inspector Les Thorgood: mark serial numbers on visible parts of computers.

number. Engraving tools can be borrowed free from many police branches or through neighborhood watch groups, or can be bought for less than \$50.

Thorgood says serial numbers should be marked on a visible part of the computer, the keyboard and peripherals, and copies of the serial number and the model should be kept. Where possible, a driver's licence number should be used. "It's much easier for us to trace a driver's licence number through our computer than a serial number," he says. "If both serial number and driver's licence number could be engraved on each piece of equipment, that would be a help."

There are a number of ways of securing your computer. If all the computers are housed in one room, perimeter security can be used. The interior of the computer room can then be secured with movement detection devices. These alternatives are not cheap, but neither is the cost of hardware.

To secure the personal computer itself, Wormald Security sells a product called a seismic detector, which is fitted to the computer, with a control unit to sound an alarm. Once activated, the alarm is triggered if an unauthorised person moves the computer. This system costs between \$500 and \$600 per computer.

A popular alternative is to bolt hardware to an anchor pad, distributed by Anchor Pad in Sydney and also available through Barsons, Parity, ACI and

Data Peripherals. Anchor Pad director Daryl Bertram says that prices vary because the anchor pads are made to suit each brand of computer. He says securing an IBM XT would cost \$580. Securing an Apple Macintosh costs \$188, and an Apricot PC costs \$246.

Another alternative is to approach the supplier of the product. Apple sells a security kit for the Macintosh for \$85. Managing director David Strong also suggests padlocking the Apple IIe, because the lid, which normally lifts out on the back, has holes in it, so a cable can be put through it.

If your computer is stolen, try notifying a bulletin board as well as the police, because someone may have heard that your computer is up for resale.

— Helen Grant

Nixdorf enters the micro fray

Another mainframe manufacturer has entered the microcomputer market: Nixdorf has now released two transportable computers it unveiled at the Hannover Fair in Germany earlier this year.

Although the two models look substantially the same, they are rather different. One is an IBM PC-compatible and the other is a machine in the AT class that runs Concurrent DOS. The machines are aimed at existing Nixdorf customers, and software is available to allow the machines to emulate a Nixdorf terminal, facilitating communication and file transfers.

The PC-compatible, the 8810/25, is claimed to run all the major software packages: Framework, Open Access, 1-2-3 and so on. It uses the same processor running at the same speed as in the IBM PC, and employs the same disk format. The operating system is MS DOS version 2.11. For newcomers, a program called EASY-DOS-IT wraps a shell around the operating system, turning it into an easy-to-use menu-driven affair.

The second model, the 8810/65, uses the Intel 80186 processor running at 8 megahertz. The machine bucks current trends by coming with Concurrent PC DOS, which is the latest evolution of Digital Research's CP/M. We expect it will also accept PC standard MS DOS, but the selection makes sense.

The processor can handle a lot more memory than a standard PC, something Concurrent appreciates when you run several programs at once. The 8810/65 can take up to a megabyte of memory internally and another 10 megabytes

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externally. The greater speed of the processor also makes it practical to exploit Concurrent's multi-tasking and multi-windowing capabilities.

At this stage Concurrent PC DOS runs all CP/M software and MS DOS software compiled under DOS 1. If your software recognises DOS sub-directories, it probably will not run. The promised version 4.1 is expected to remedy this.

Both machines share the same display, a 23cm amber screen, and a built-in 80-character printer. The 8810/25 starts at \$4142 and the 8810/65 about \$11,689. For more information, contact Nixdorf Computer at (02) 439 5477.

— Gary Ross

In the market for managers

When Jim Gallagher looks for a manager to set up a computer shop the last thing he worries about is whether he knows anything about computers. Gallagher is the managing director in Australia of Entre Business Centres Pty Ltd, an overseas-based computer store franchise chain, and right now he is in the market for more than 20 managers.

"We can teach them all about micros," says Gallagher, "as long as they show us they can run a business and come up with the right finance. Entre Computer Centres has run it that way in the US

since 1981 and it has never had a centre close down."

Gallagher says Entre will open 24 stores in Australia, starting with six early next year in Sydney and Melbourne. The stores will be very clearly identified as "IBM shops", stocking the IBM PC range and at least one compatible.

Entre has been a highly successful operation in the US. The company was established in April 1981 and had more than 20 US outlets operating within a year. It went public at the end of 1983 and began moving into the European market early last year. With 260 stores, Entre is now the fastest-growing franchised computer store chain in the US.

Gallagher expects to have the first two Entre centres open in Australia in February next year. All centres will be franchised outlets.

— John Kavanagh

Internal modems to meet local laws

Portable computer suppliers are working on internal modem designs that will meet local Telecom requirements. The internal modems are a strong selling feature of portables sold overseas, but they have not been readily available in Australia because of local technical requirements. Suppliers are moving to bridge the gap.

NEC and Tandy have new portables on the market and are developing

modems to suit local requirements. Hewlett-Packard will launch its new portable here in September. The first machine, called the Portable Plus, will not carry a locally approved internal modem, but HP says it will offer an internal modem upgrade later.

The Telecom approval process is not only holding back the use of internal modems in locally supplied portables, but is also delaying the release of new products. NEC's product manager, Daniel Petre, says release of its 8401 portable was delayed while Telecom tested the modem.

Telecom insists that its safety standards are necessary and wants to ensure that when foreign equipment is converted from 110 volts to 240 volts the power upgrade does not cause voltage leaks into the phone line. "We don't want 240 volts coming down a 40 volt phone line while a technician is working on it," says a Telecom spokesman. "We want to be sure we have proper line isolation."

Petre says he has found Telecom engineers helpful and businesslike, but believes that telecommunications standards in Australia should be more in line with international standards, and should be put in the hands of a third party like the Standards Association of Australia.

"Having to carry an acoustic coupler with the PC does take away some of the advantage of the portables," says Petre.

— John Kavanagh

BRIEFLY

By Gary Ross

Imagineering has signed a deal with Myer under which it will, wherever possible, be the sole supplier of software to the store. Under the agreement, worth an estimated \$2 million, Imagineering will also supply peripherals, but on a non-exclusive basis. Imagineering was one of four software houses considered by the retail chain.

Australia's first intelligent 1200-baud modem has been released by Shuttle DataCommunications of Victoria. Called the Volksmodem, it comes with the Mite+ communications program and is available with a range of preconfigured adaptor cables to suit most computers on the market including Apple, DEC, IBM PC, Macintosh, Tandy, Televideo

etc. The unit can handle both CCITT and Bell standards, is Hayes compatible and will work with programs such as Framework and Symphony. It features auto-dial and auto-answer and is Telecom approved for direct connection to a wall socket. The recommended retail price is \$860. For more information contact Shuttle on (03) 267 1011.

The Northern Territory Electricity Commission has bought 10 Taiwanese IBM clones and is expected to buy more. It has selected the Tava PC and says the machine's better price and performance — its clock rate can be switched from the standard 4.77 megahertz to eight megahertz — were the reasons for the purchase. More orders are expected.

Anadex has released a new dot-matrix printer which can attach directly to an IBM mainframe through an IBM 3274 or 3276 cluster controller. Called the

DP9632B, it works in the IBM 3270 environment at speeds up to 240 characters per second and can reproduce graphics at densities of 72 x 72 or 144 x 144 dots per inch. A Centronics compatible interface enables the printer to be shared between the mainframe and personal computers such as the IBM PC. For more information, contact the distributor, Datascape Pty Ltd, on (02) 969 2699.

IBM has started up an electronic help service — a database containing answers to 4000 of the most frequently asked questions about PCs. The database contains information on hardware and software products and how to use them, techniques and product news. The information will expand as new products are introduced, and IBM promises to supply answers to questions not covered. For more information, contact your local IBM office or your local dealer.

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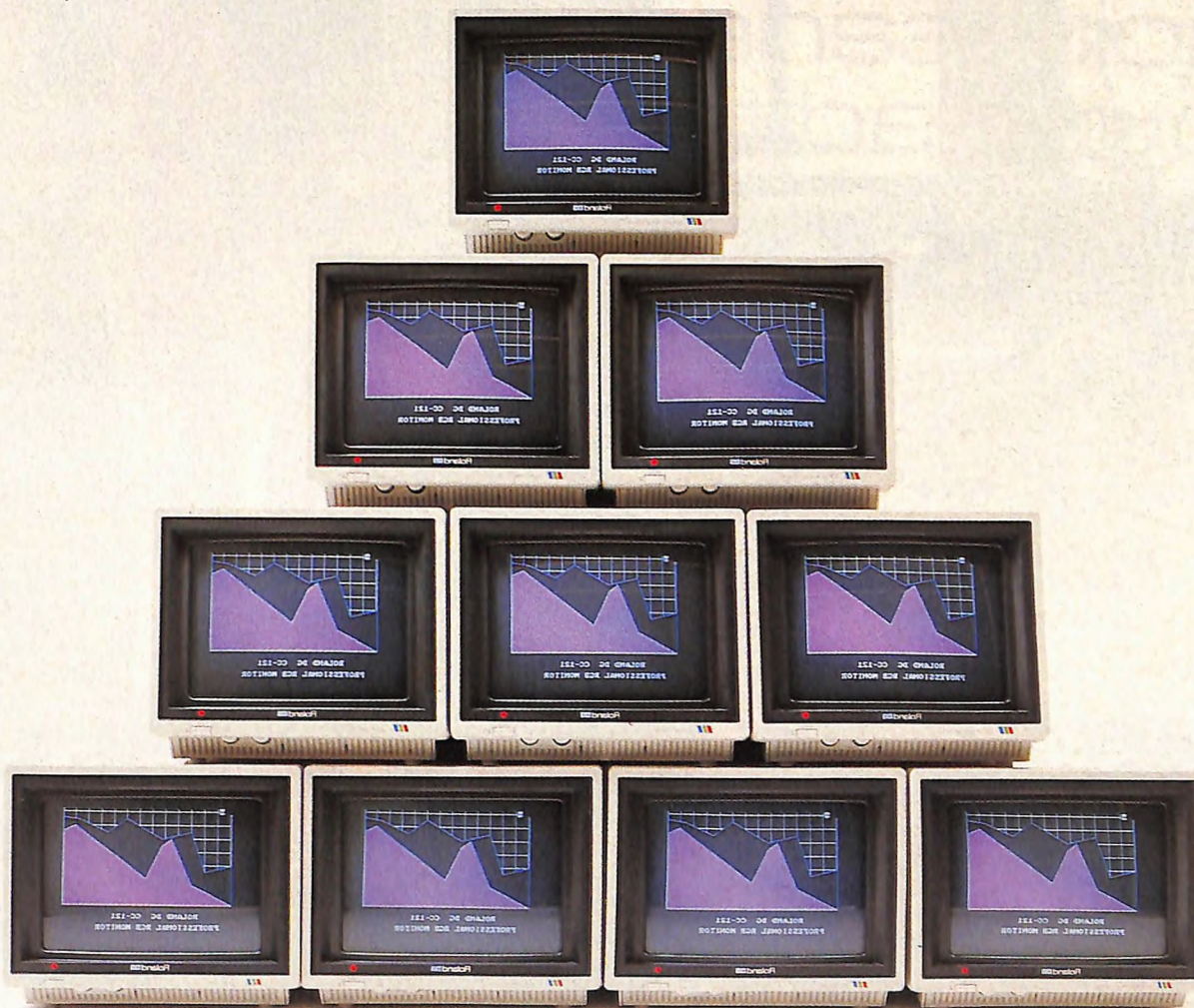


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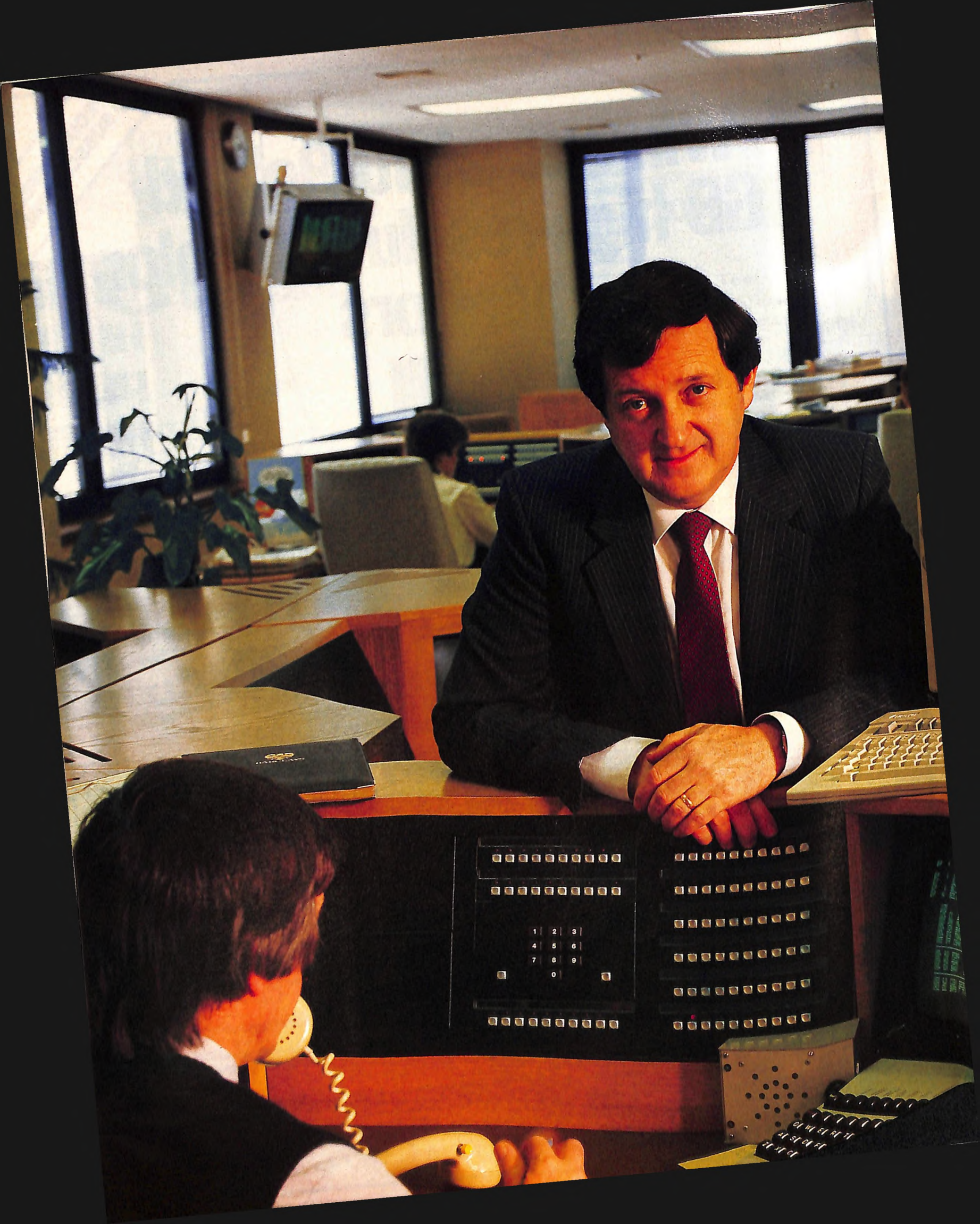
There will be 10 winners in this simple competition for Roland's best-selling CC 121 30cm high-resolution color monitor. The monitor is designed to minimise eye strain and offer clear resolution for both text and graphic display. It is compatible with most micros including the IBM PC and XT, and the Apple II.

Included with the monitors are the exciting Australian-made Sprite graphics cards, which give Apple IIs the ability to produce professional 3-D animated graphics. The Sprite cards disregard Apple's video circuitry and produce 16 brilliant colors over 32 planes.

To enter the draw for one of the Roland DG color kits, valued at \$1275, your 12-month subscription to *Today's Computers* must be received in Melbourne no later than September 30, 1985.

Circle the correct answer from the three multiple-choice questions and fill in the subscription card opposite, enclosing your cheque for \$30 payable to *Today's Computers*. You pay for 12 issues and receive a free bonus copy of *Today's Computers*, and you are automatically in the running for one of the Roland prizes.

CONDITIONS OF ENTRY. 1. Prize is not transferable or redeemable for cash. 2. Competition cannot be entered by staff members of Roland DG Corporation (Australia) Pty. Ltd., John Fairfax & Sons Limited or their associated companies or advertising agencies. 3. Only persons taking out a twelve month subscription to *Today's Computers* are eligible to enter the draw. 4. Judge's decision is final and no correspondence will be entered into. 5. Closing date is September 30, 1985 in Melbourne. 6. Residents of South Australia are not eligible to enter. 7. The winner will be advised by mail, announced in the November issue of *Today's Computers* and in the public notices of *The Australian* on October 2. 8. The Raffles and Bingo Permits Board Permit No. 85/579 issued on 12/7/85 Permit No. TP85/314 issued by the Department of Territories and Local Government. Approved by the NT Racing & Gaming Commission.



Million-dollar transactions at the touch of a key

Australian bankers find that personal computers are indispensable when dealing on the international futures and financial markets

By Pamela Williams and
John Kavanagh

Every day Australian banks are carrying out transactions worth millions of dollars on foreign exchange and short-term money markets at the touch of a key on ordinary personal computers.

In the Sydney offices of the Australian Bank, the manager of the financial markets group, Ken Chapman, identifies profit opportunities on the international futures and financial markets on his IBM PC, and accordingly hits those markets until the profit opportunity disappears. Chapman has been a dealer on the short-term money market for 2½ years and says that it would now be impossible to trade using a hand-held calculator, as he did in the old days.

The Australian Bank's personal computer experience started three years ago with the purchase of an Apple III, which the bank used primarily in its treasury department and for balance sheet management. The bank's general manager (strategic development) in the Melbourne office, Stephen Clarke, says the scene changed when Lotus 1-2-3 came along.

"That gave us a lot of scope," Clarke says. "Spreadsheets are the general use we make of PCs and we have them where you'd expect to see them. We already had IBM 4381 and 4341 mainframe computers and we decided to stick with the one supplier. What's happened since then is the use of spread-



Ian Minchin of
Barclays: uses a
modem to get
account
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York

USER FILE

sheets throughout the bank. We have between 20 and 30 IBM PCs across a staff of 450 working in all areas of the bank."

Several of the PCs have mainframe compatibility provided by third-party suppliers, which Clarke says the bank would have expected IBM to provide. This includes an IRMA card that allows a PC to double as a mainframe terminal without interrupting the functions of mainframe or PC. Tempus Link software disguises the mainframe and makes it appear as extra disk drives to the PC. This lets the bank network PCs via file-sharing on the mainframe. Up to a dozen people are using this as a general tool, and financial planners in the bank are using the software for a variety of specialist applications including cash management facilities.

The Australian Bank has developed software to run its approved deposit fund. "We have actually got to the point where other people are buying it," Clarke says. "Basically it's a small accounting system that maintains records for the fund."

The oddball in the bank's PC applications is a facility used as a data pump between Reuters screens and the mainframe computers. Reuters offers information via a communications link, and the bank is using its PCs to handle that link and appear to the mainframe as a conventional terminal.

Information is extracted from the financial markets both domestically and internationally, covering bill rates, foreign exchange, the futures market and some commodities information, and it is analysed in the mainframe.

"Obviously, if you can analyse financial market information you can spot arbitrage opportunities," says Clarke. Arbitrage is the situation where the dealer uses two markets to create a profitable transaction in a third market, or when he identifies the point at which a purchase in one market and a swift sale in another at a higher price will yield a profit. This usually continues until the opportunity is exhausted.

In the bank's Sydney dealing room Ken Chapman says the PCs have changed the volumes dealers can work with. "In the morning we enter in the daily money market rates and the PC monitors the market," he says. "This number-crunching goes on all day long and we determine where we'll buy or sell

until we reach the limit. Normally we can tell whether there is an arbitrage or not, or else we can see where the markets will have to move to before we begin to deal. The PC is a crucial tool to help us determine profitability and rates."

Explaining that volume has increased

The explosion of the futures market has meant that PCs are crucial

to the point where a hand-held calculator is inadequate for the volume of calculations the dealers require he says: "The faster you can work, the more your profitability increases. As far as portfolio management goes, it would be impossible to do it manually."

In the ANZ's Melbourne dealing room, 10 IBM PCs and one IBM PC XT handle the analysis of the bank's domestic market dealings. Throughout the day the bank's dealers and traders in bonds or semigovernment bonds use the PCs to analyse the deals on which millions of dollars swing.

The ANZ's senior manager (fixed-interest securities), Murray O'Dwyer, says the PCs operate as part of an overall system with the bank's mainframe and Reuters screens. O'Dwyer says a typical situation would be where a dealer responds to a call from a broker offering a deal. "You'd tend to look at the current market rates on the Telerate or Reuters screens and then go to the PC to analyse the deal," he says. "The sort of money market system we've got is linked into a mainframe and so we immediately key in all new deals to update the portfolios."

The volume of trading at the bank runs into billions of dollars every month and that figure is sometimes approached on a daily run. The dealers restate the point made by the dealers at the Australian Bank: without the PC as a tool, the volume of trade and, consequently, profit could not be maintained. They describe it as a streamlining of business.

While domestic money markets are closed at night, dealers decide daily whether to leave funds in the market or withdraw them from the impact of any daily changes. Amounts, terms and

rates are entered into the PC and the dealers then key in the planned deal, with the PC assisting in the final decision by providing up-to-date information. Changes to the portfolios are automatically updated in the mainframe.

The explosion of the futures market has meant unprecedented levels of trading and the bank's senior manager (futures), Murray Carr, says that PCs are crucial to trade these markets. The total volume of bank accepted bill futures contracts for the year ending December 31, 1984, was \$85.4 billion; the volume traded to June 30, 1985, was \$89.8 billion. To trade these volumes it has become essential to perform complex calculations at a moment's notice.

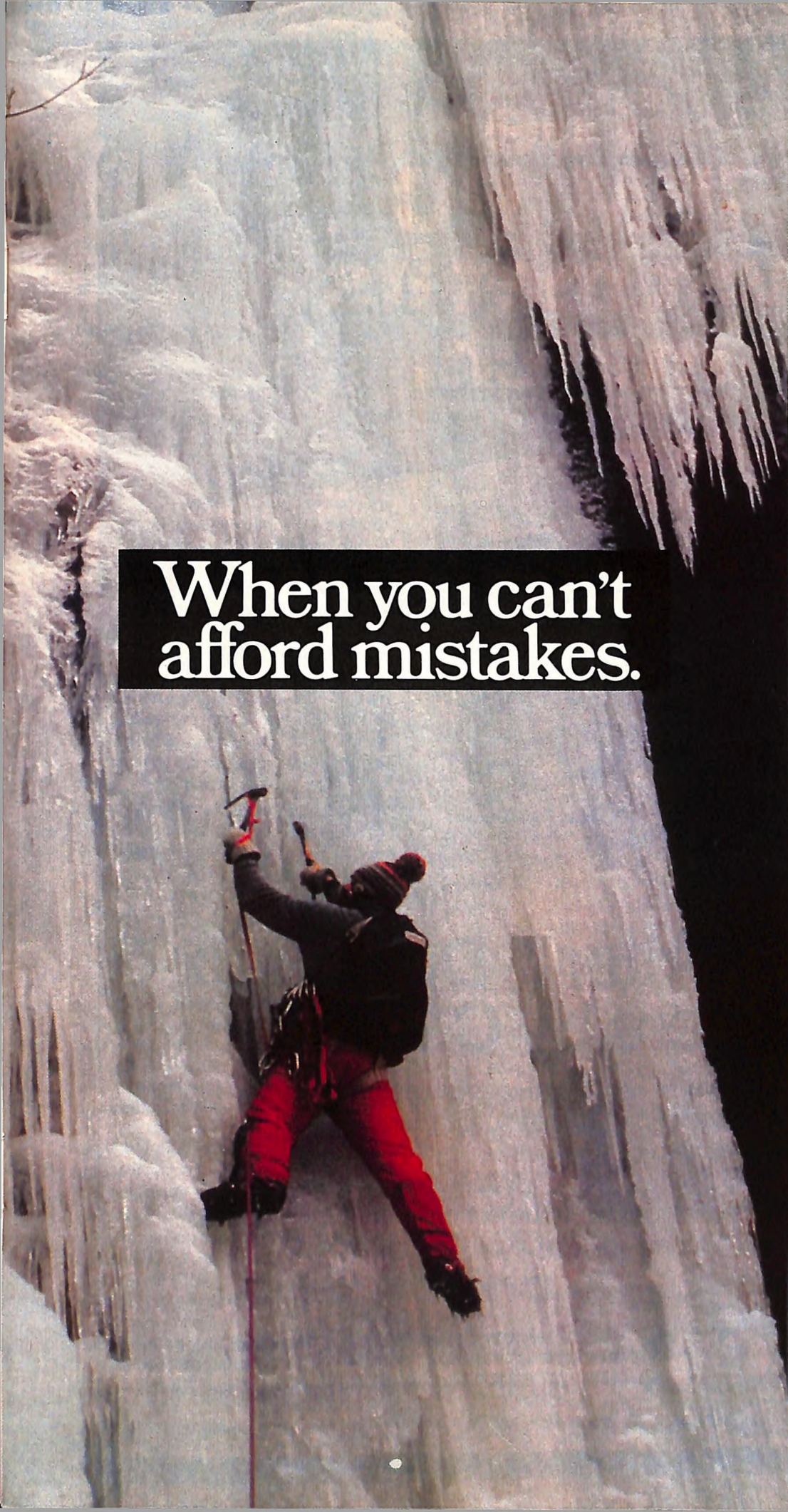
Carr describes the complex information required for the snap deals that are made. "We monitor the market on the Reuters screen. Given the prices and access to the physical bills market, you crunch that information in the PC and it throws up a rate of return. If the rate of return is suitable, we act. Millions of dollars are resting on that analysis we get from the PC."

The market opportunities are so sophisticated that these opportunities sometimes last for only a split-second and traders act instantaneously. "You run the deal through the PC and if you get a set of variables within a set of criteria you know the deal may be on at any time," Carr says. "So you watch your Reuters screen and when you get the figures you're waiting for, you make certain assumptions and make the move."

The PC takes account of all the historical data and establishes a volatility for the contract. It then applies that to the anticipated volatility the contract will experience. It quantifies the risk in a similar fashion to that used by insurance companies to estimate the length of a man's life to work out an insurance policy and premium.

Carr says the PC makes the management of the risk more achievable. "It means you can reduce the likelihood of loss," he says. "You reduce the risk because you can make decisions faster. We're all working on time margins."

The general approach of the ANZ to the use of personal computers has been to actively encourage end-user development. The information centre provides users with an IBM PC and a standard set of software packages that usually



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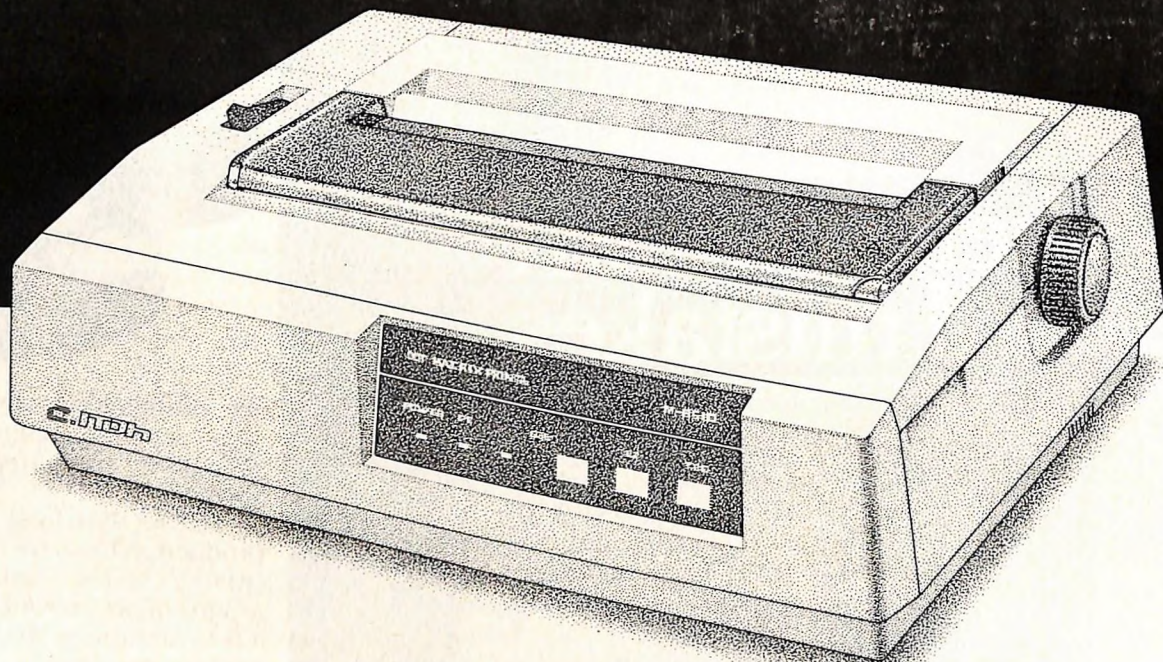
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includes 1-2-3, dBase II, dBase III and some training. The bank is still evaluating graphics packages.

The administrative headquarters of the ANZ is in Melbourne and all policy guidelines on personal computers are made in Melbourne. Most PCs are stand-alone, although the bank is putting in more local area networks to share disk space. Installation of PCs is approaching 300 Australia-wide, with the greatest block in Melbourne, which makes them almost as common as the calculator was 10 years ago.

One of the banks invited to apply for the new licences, Barclays Australia Limited, has been using PCs to account for foreign currency deposits and lending book transactions maintained in Australia along the lines of a Euro-currency book. This is the lending or borrowing of a wide range of currencies in Australia and contracted between residents, therefore avoiding withholding tax. The bank is running these records on a Apple III microcomputer. Three Apples and a Wang are installed in the bank's operations department, where they perform accounting, monitoring and reporting tasks.

Ian Minchin, associate director (international) at Barclays, describes the computers as vital. "Without the reports they put together the dealers can't operate," he says.

Every time a deal is done, either on the money market or in foreign exchange, the information is entered on a sheet in the dealing room and then passed on to the operations centre, which records and checks the transaction. It is formatted for overseas transmission and entered into the PC for updating positions, reporting and accounting. The details are updated on the client ledger and a maturity file to show the different time periods. It also updates currency files and revalues the currencies involved at current exchange rates to identify profit or loss movement.

Information on any Barclays Australia account maintained overseas can be accessed through the bank's BarCam (Barclays Cash Management) electronic funds transfer system, to get up-to-the-minute balances. "If we sell a customer \$US20 million it has to come out of our US accounts," Minchin says. "We want to make sure that the amount has been debited to our account. We need to be

sure that the transaction has proceeded immediately."

Minchin says he can dial up New York or Paris on his modem for bank account information. He can check the balance of accounts and transaction details, and in some instances effect payment. The details appear on the screen of the Wang PC on Minchin's desk as well as in hard copy. Minchin says he uses it every day to get the balances of overseas accounts.

"Previously you had to ask New

Barclays has used Multiplan to give up-to-date valuations of portfolios

York to telex the balance," Minchin says. "If you had a hiccup and you couldn't get on the phone because they were all asleep in New York, you would have to wait until the next day to get what could be vital information. The beauty of this is that you can get your information any time you want."

Barclays also uses PCs in corporate finance, financial advice and treasury. Corporate finance is using two Wang PCs on which they have built a Multiplan system to assist in risk analysis. The system enables financial advisors to analyse lending positions. Potential borrowers provide financial information and balance sheets that are used with sensitivity analysis and financial ratios to produce reports on the PC.

Barclays' financial advisory service is using a Wang PC to value companies in mergers and takeovers. The prospective investor approaches Barclays and requests a study to confirm or recommend how much to pay for the nominated company. The financial advisory staff feed certain information into the model, which then comes up with a series of suggested prices with the option of altering variables to make other suggestions.

In treasury Barclays has used Multiplan to build a system that gives an up-to-date valuation of investment portfolios. The system is used throughout the day as the market changes. If Barclays buys bank bills, the investment is keyed in as a portfolio. Over the next

few days the market prices of the paper are keyed in and the PC calculates the profit or loss.

Barclays also uses the PCs for graphical presentation of currency variations and interest rate variations, as clients respond more to the graphs than to rows of figures.

At the State Bank of Victoria, PCs are making a more cautious entrance. The bank took a strategic decision 12 months ago to standardise on IBM, although the bank's deputy general manager of administration, Max Carr, says that policy could be altered if necessary.

"We decided on IBM after looking at the market fairly thoroughly," he says. "We haven't networked them yet; that's for the long term." State has 67 PCs, of which at least 50 are IBM PCs or XTs, with four PC slaves and seven IBM-compatible Olivetti M24s.

The bank is using PCs in the lending area to analyse the operations of customers wanting lending facilities, as well as corporate planning, research, economics, organisation and methods. PCs are used in these areas as management aids.

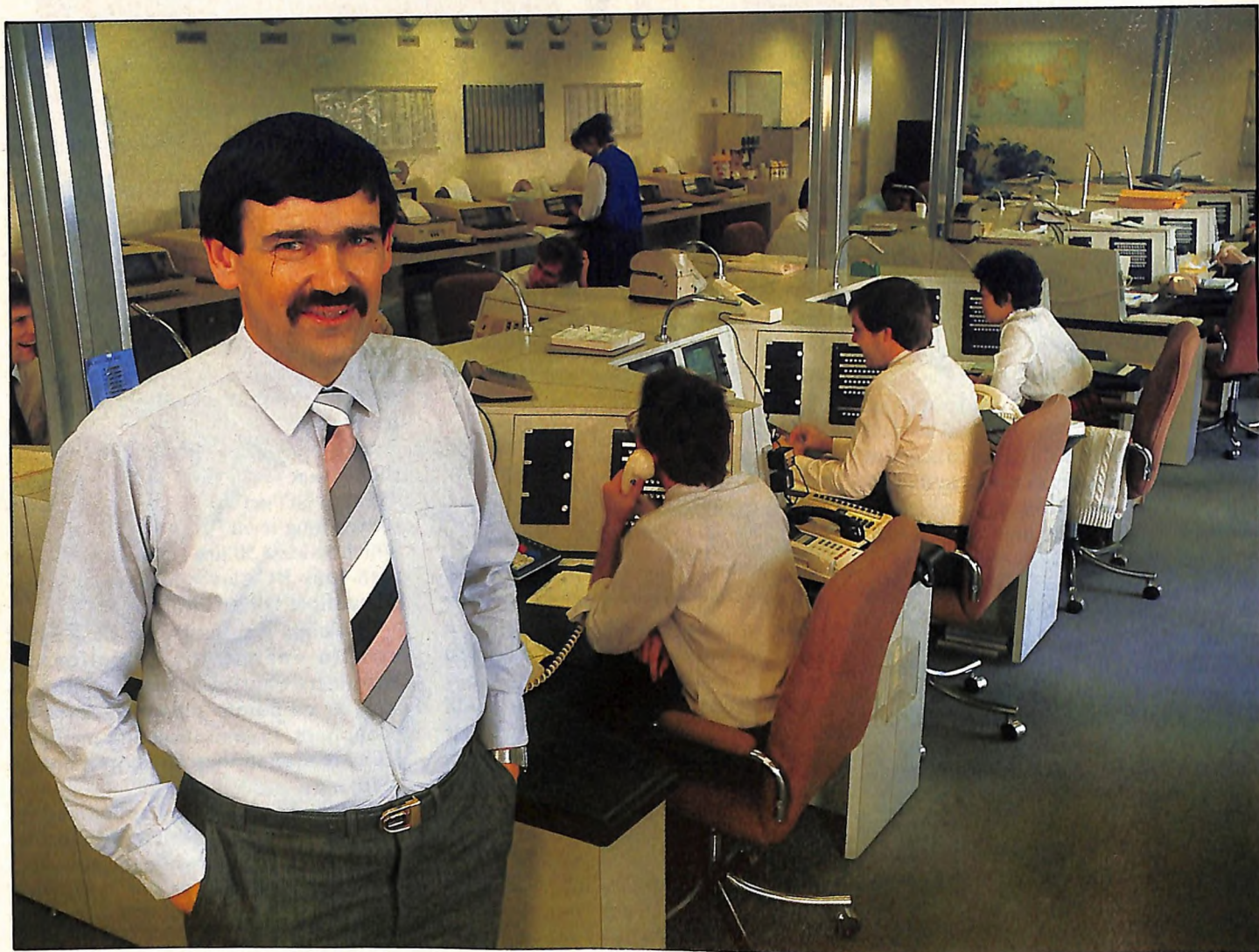
The bank is using 1-2-3 and a financial analysis tool called Micro FC for accounting purposes, while the advances (repaid loans) department uses 1-2-3 and dBaseIII and analysis of claims accounts and restructuring loan schedules, and dBaseIII for file management. The Bankcard department uses 1-2-3 for financial reporting and dBase for point-of-sale merchants.

The premises department has bought a package called Versa-Cad, which is a computer-aided design facility for producing architectural drawings, building services and electrical services. The bank is in the process of putting branch layouts on the system to provide options for design and layouts.

A more unusual installation is the PC the bank uses at its residential staff college at Baxter in Victoria. Staff follow a two-week course on various levels of banking as well as peripheral studies such as human relations. Management and attendance records are all kept on the PC.

Australia's newest bank, the Advance Bank, is in the midst of a major computer overhaul. The bank ordered two Burroughs A15 mainframes last month; these are among the biggest commercial

USER FILE



The ANZ's Murray O'Dwyer: PCs operate as part of an overall system with the bank's mainframe and Reuters screens

computers and, at \$6 million each, will act as the bank's processing workhorses.

Over the next 18 months the bank will rebuild its computer system, and personal computers will figure largely in the new scheme of things. John Brennan, the Advance Bank's general manager (corporate services), says the bank already has 50 PCs operating in various stand-alone functions, and expects that number to double over the next couple of years. The bank has bought IBMs, DEC's and Apples, although it has tended to standardise on IBM and IBM-compatibles recently.

The bank uses standard applications packages: Lotus 1-2-3 for financial planning and off-the-shelf word processors. Brennan says that users satisfy a great variety of requirements with standard packages. "We did all the critical path analysis for the transition from a

building society to a bank on a PC," says Brennan. "It took us nine months to make the transition and we managed to project with Lotus 1-2-3."

The bank's primary PC users are its middle management staff in the planning and research departments, accounting and customer services. The applications are varied — even the car fleet is managed on micros.

"Our biggest problem with the PCs is trying to stop them being moved around the building; everyone wants to use them," says Brennan. "We try to keep our guidelines loose. We have an information centre there to provide advice, but it is friendly advice. We encourage people to use the machines and our only real control is to see that there is no indiscriminate buying."

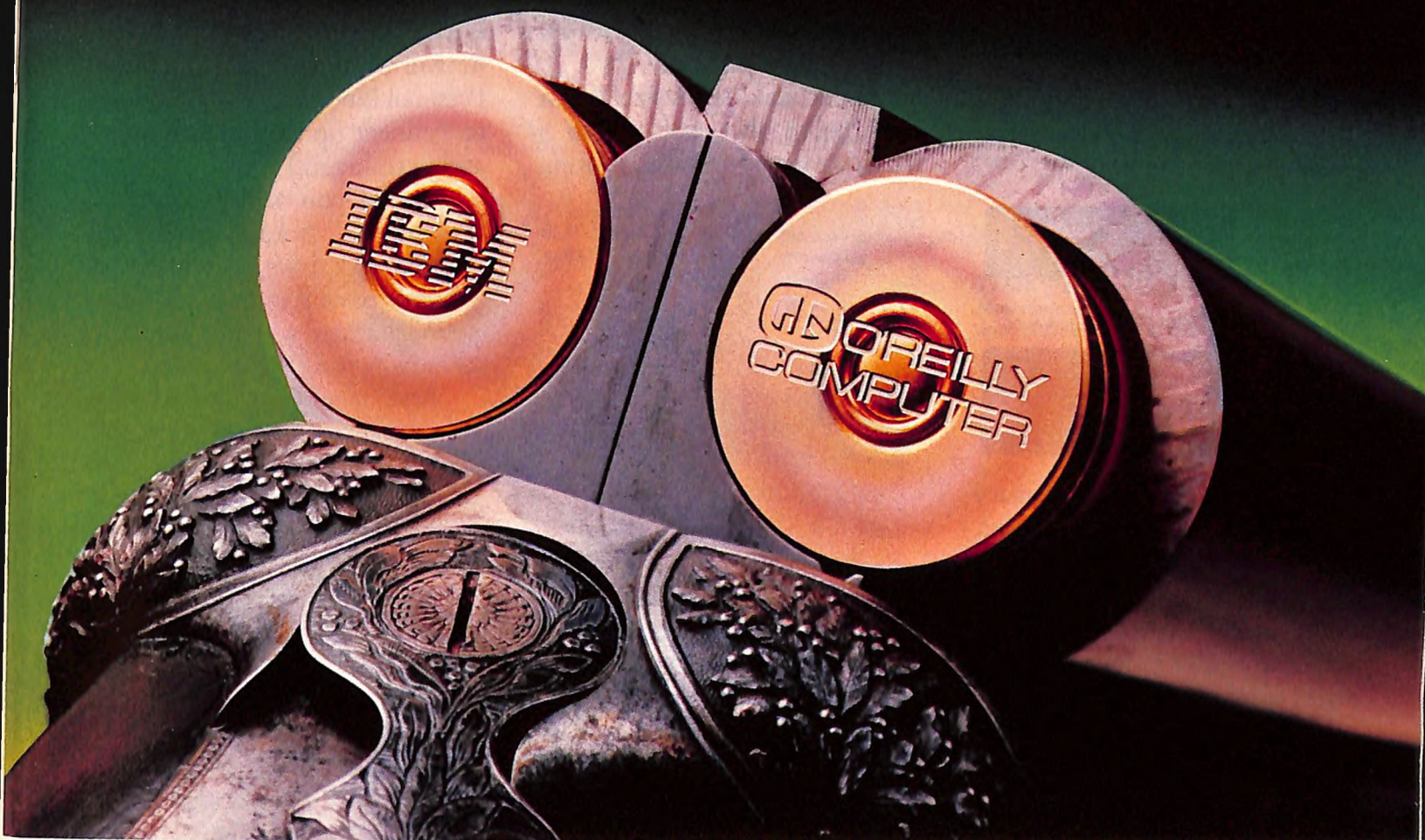
The Advance Bank's chief general manager, John Thane, keeps a micro at

home; he is able to take disks home with him and review reports and budget statements. "There is usually a PC on the table during top-level meetings," says Brennan. "During these meetings managers use them to do what-if calculations on budgets and to look at projections for new products."

The machines are currently stand-alones, but the bank's DP department is testing software for downloading data from mainframes. "One of the keys to the future of our system will be this downloading capability," says Brennan. "We don't know all the answers yet, but I don't think anything we do now will prejudice our ultimate development. The important thing is that people are learning to use PCs and are enjoying them."

With the decision on the A15s out of the way, the bank is looking at its branch

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Standard 135mm (5¼") floppy disk.



Macintosh's 400K 90mm (3½") disk.

are big enough to hold a desk-full of work, they are small enough to fit in a shirt pocket.

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And, of course, there's a built-in connector for Macintosh's mouse, a feature that can cost up to \$500 on computers that can't even run mouse-controlled software.

Of course, the real genius of Macintosh isn't its serial ports or its polyphonic sound generator.

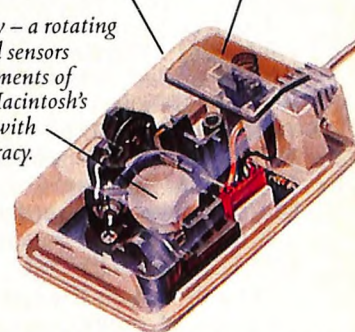
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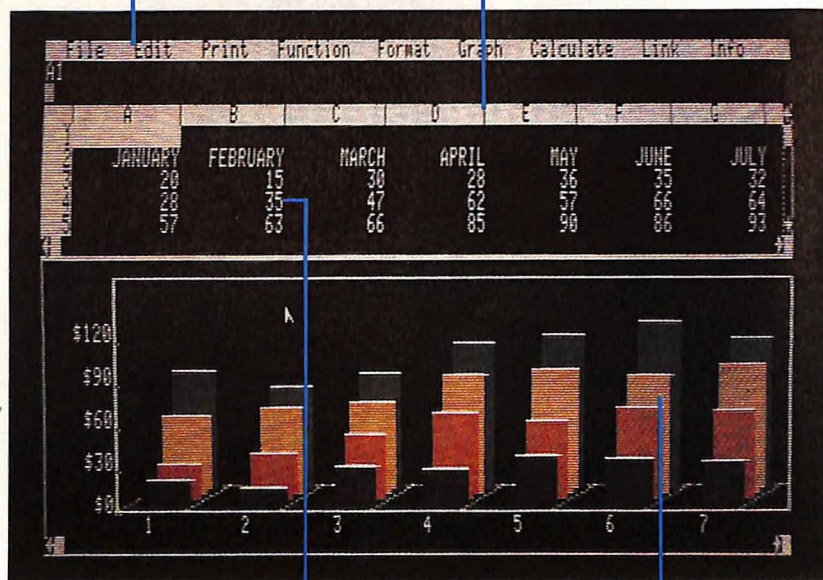
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network. It also has to evaluate its options for networking — it can run the head office system off the mainframe or use a local area network.

"We are enthusiastic users of PCs and confident ones," says Brennan. "It would be difficult to see how some work could be done without them now. But, while they are an important tool, we are trying not to be obsessed by them."

Westpac's personal computer user support group is installing almost 20 machines a month. Most of the 300 now in service have been installed in the past 12 months, and the user support group can't keep up with the demand. The group's manager, Peter Murphy, says that interest in computing is widespread, and the PCs so far installed "barely touch the sides". His group is regularly reviewing applications and will have to increase the PC allocation in its budget if it is to keep pace with requirements.

But Murphy is determined not to rush things. His group and the bank's information systems group are moving towards a network system based on IBM's SNA architecture. "Our PCs all operate as stand-alones now, but we envisage having thousands of them communicating through an SNA network that will tie in everyone from our senior manager to our branch staff," says Murphy.

Murphy is particularly keen to see the bank's senior executives get involved with computers. Apart from the benefits he believes they will get, he feels that successful implementation of a corporate network will have to flow from the top down. "We are in the computer age," says Murphy. "The people at the top of the bank have to be computer literate and understand that the business world depends on these things now. Already we have senior members of general management operating their own PCs."

Westpac is an IBM shop, from its mainframe to its automatic teller machines. Its personal computers will all be IBM models and will include IBM's 3270 terminals.

When Westpac decided that micros would be an important and widespread work tool within the bank, the information services group handed over responsibility for their development to a new group, Murphy's user support group. Information services manager Noel Lipscombe wanted to ensure that micros would get the attention they deserved

and not be treated as an additional chore for data processing staff.

Murphy says there is at least one personal computer in each bank department. Initially users had to demonstrate a cost benefit before they could have one, but Murphy says that is changing. "We want to go beyond that," he says. "We want computers to be part of people's work."

Most of the software in service is standard packaged material. The bank

Westpac is an IBM shop, from its mainframe to its automatic teller machines

writes some of its own, but it prefers not to; it would be impossible to write and support the software for the bank's user community.

In the long term, Westpac will use IBM System 36 minicomputers as file servers within a building or department. The file servers will be linked into mainframes using IBM's distributed information operating system. The bank will also use IBM's 4700 network to link its branches; it is a network system similar to the one already being used to link the bank's ATMs.

Murphy says Westpac has not yet decided to use micros in branches, but he believes they will have a very good application in its regional offices for balance sheet analysis on the lending side. A system for regional offices is in its pilot phase. In addition, portables are being tried out by the group planning department.

Peter Martin, assistant manager of the Commonwealth Bank's data processing division, describes his role as one of leading the bank's staff into new computer applications. But when it comes to personal computers, Martin is not so sure who is being led and who is doing the leading.

"We have some very computer literate people in some of our departments," says Martin. "So far it has been our professional/operative staff who have taken up PCs. These people are usually graduates and have had some exposure to computing before coming to the bank; they know what they want to do with computers."

The Commonwealth has about 100 micros in its interest, investment and economic research divisions, in its money market and foreign exchange dealing rooms, and in its group treasury, corporate banking, personnel and accounting departments.

Choice of software is broad. The bank's information centre can provide Multiplan, Lotus 1-2-3, Symphony, WordStar, PC Focus, Chart, Project, Golden Gate and Expert Link. Martin says his department likes to maintain some control, and the bank usually asks for a cost justification before handing over a micro. "We have to keep the lid on it a little bit," says Martin. "The best judge of the need is the chief manager of the department."

The bank's information centre gives two or three days training at the time of installation and runs through the usual "DP shop" guidelines about data security, backup and so on. "My feeling is that the introduction of PCs has cut out days of routine work on calculations," Martin says. "It is making a major productivity contribution."

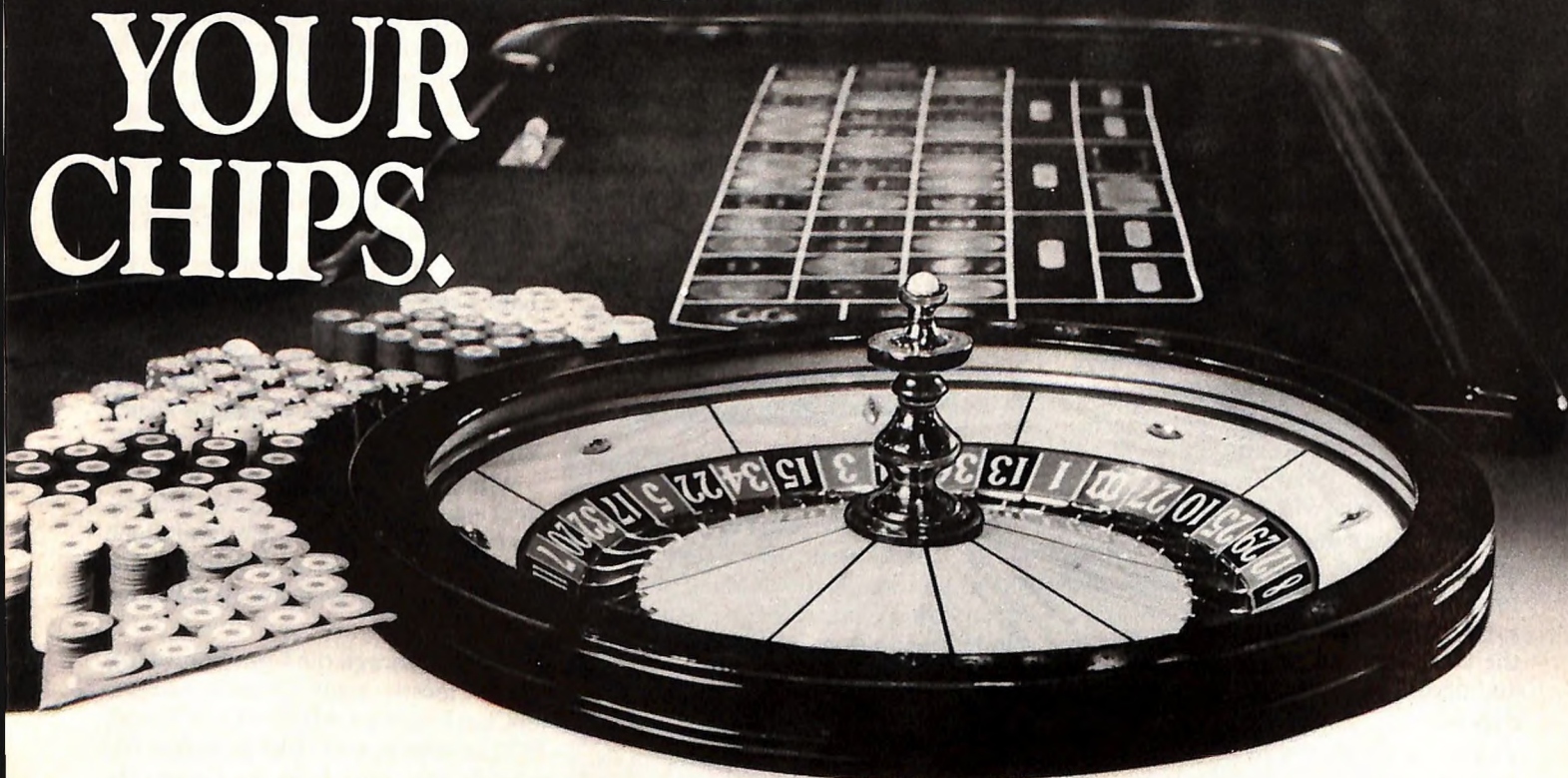
Gary Mackrell, an officer in the bank's corporate treasury, says personal computers allow the bank to offer greater services. "We have expanded our range since we got the PCs, and we have not yet got to the end of the road," says Mackrell.

Martin's chief concern is with the next stage of development. He believes that users will outgrow their stand-alone capacity quite soon and it is the DP department's job to draw up plans for the long term.

Three years ago the Commonwealth bought locally made Dolphin computers, but it now buys IBM PCs, XTs and 3270 terminals, and IBM portables for use by rural valuers in the Commonwealth Development Bank. The bank also has some Olivetti M24s in its foreign exchange department.

"In our office automation picture we see IBM's System 36 controllers as an intermediate step to a mainframe connection," says Martin. "We have a lot of stand-alone word processing and we are looking at electronic mail and diaries to go with that. We are experimenting with database development in our department. We have to go steady on this, but I hope we can start moving on it by the end of this year." ■

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THE FUTURE

Enter the electronic secretary

By Pamela Williams

Development of the office of the future is well under way

Awalk into the office of the future could take you into an environment without paper, with a staff of electronic secretaries, where people communicate and decisions are made via electronic media, and executives toss their problems around with a machine rather than a human.

This may all sound rather like science fiction, but when the director of Xerox Corporation's artificial intelligence unit was in Australia recently he predicted that within 10 years technology would provide us with electronic pocket secretaries capable of making appointments, booking airline tickets and contacting other secretaries to renegotiate appointments.

Peter Fisher is the director of Vista Laboratory, a special research unit within Xerox's special information systems division, and has been involved in the company's artificial intelligence development since its earliest stages. He has no qualms about the impact of artificial intelligence, and says the development of the tools to make the office of the future available commercially is well under way in the world's research and development labs.

"In 10 years we will have machines capable of speech input rather than voice input and the computers we work with will be extremely portable," Fisher says. "I'd like to think these machines will be very small, perhaps an A4 size. The size will be limited only by the screen-size required for visibility. I think we'll have pocket secretaries we can talk to. They will be able to advise and suggest alternative actions, and we will be able to teach them various things."

He says the communications abilities of these machine-secretaries of the future will enable them to perform such activities as contacting other secretaries or databases for information about flight schedules, sharemarket quotes and financial information.

Fisher prefers the term pocket adviser to pocket secretary, but the meaning is the same. The biggest impact of these

increasingly sophisticated programming tools will be felt in the business environment.

"I have a definition which says that when we have a problem we can't solve we call it artificial intelligence. Once we have solved it we call it good programming practice," Fisher says.

He thinks the quality of the information processed will be much better in the future, and says that office workers are information processors in the sense that they organise, plan and process information.

Fisher uses an artificial intelligence system himself — the Xerox system, naturally enough — and says it provides him with short-term memory, among other things. The system allows him to organise thoughts, extract information from various sources, and link them up.

He says it can organise arguments for him, keep lists, and help produce weekly reports. Up to 60 percent of Fisher's office interaction is through a video screen which he says enables him to see far more of his staff than otherwise. The use of paper has been virtually cut out.

Fisher says technology developments are bringing a voice-activated typewriter very close. There are already systems which can understand natural language and interact with people, and we already have the communications technology. Fisher says the elements are all there, they just need further development and maturation.

Games theory will be paramount in the world of the electronic secretary, and Fisher predicts that companies with the best electronic advice and expert

systems will be the ones to succeed, while those which fail to embrace the new technology will fall by the corporate wayside.

Fisher is unperturbed by the impact of these changes and says they have already improved his life, as they will ours.

Fisher agrees that there can be problems involved in moving too fast, particularly in areas with military ramifications, but insists that progress will provide better systems and better control of these systems, which will be preferable to humans.

While many people refuse to accept that machines could replace humans in the workforce one day, Fisher is convinced there are many tasks at which they could excel. "They will free the human and greatly improve the quality of life. One of the things about artificial intelligence systems developed today is their ability to provide explanations and develop alternatives. I think it's imperative that our decision-makers be provided with the best consultative mechanisms available," he says.

He adds, though, that many of the systems he refers to are intended to assist humans, not replace them. They will be in a position to advise, not decide, leaving the individual to make the final controlling decision.

Fisher doesn't think much about the social meaning of his work. As a scientist he is interested in developing the future, not controlling it, and he believes that techniques such as typing and filing will soon disappear as new skills are developed.

"I think we're talking of a 10-year process. We have already seen the transition from typist to word processor. To be honest with you I don't think much about the ramifications. We are very excited about the future and I think it's a mistake to postpone the impact of technological advances on the workforce. It's like talking about postponing the introduction of the internal combustion engine out of concern for the buggy-whip manufacturers." ■

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THE INDUSTRY

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By John Kavanagh

Software houses react to criticism of integrated packages

Software developers have now decided that good things come in small packages. In several moves that will hit the market over the next few months, some big software houses will start to "unbundle" their integrated packages.

Ashton-Tate is due to offer a version of Framework based around its word processor. Software Suppliers will release Access 4, a package based on the spreadsheet module in Open Access. Lotus will launch a new version of 1-2-3 that will make it a fully compatible module of Symphony.

This unbundling is occurring for a couple of reasons. The high price of integrated packages in Australia is holding back their acceptance in the market. While packages like Symphony are selling in the US for about \$600, they cost \$1000 locally. Distributors agree that the price is too high, and they expect to have more success introducing users to integration through unbundled modules, which will sell for about \$400 each.

The other problem is that first-time and occasional users find the integrated packages too difficult to learn or to use fully, and buyers do not feel they are getting value for money if they use only a section of the package.

Brisbane distributor Arcom Pacific expects to have the word processor-based offshoot of Framework in September. The package, to be called Frameworker, will have Framework's characteristic frames and outliner. The package will also be set up to integrate with other modules coming out of Framework.

A spokesman for Imagineering says Lotus has no plans to unbundle Symphony, but 1-2-3 will be offered in a new version that will make it an entry module into the larger package. The new version of 1-2-3 is expected in October, but

Imagineering expects Symphony 1.1 to be on the shelves before then.

The upgraded Symphony package will have more efficient memory mapping, 8087 compatibility, enhanced graphics, better documentation and an on-line help menu. Lotus has released its Symphony development code and is expecting other software and peripheral makers to produce enhancements to Symphony.

Symphony is the most successful of the integrated packages in the US, where Lotus has sold 150,000 packages to date. According to Imagineering, sales of Symphony are up to 2500 in Australia, but Focus Research estimates that Open Access is outselling Symphony locally. Open Access rated sixth on the Focus top ten, while neither Framework nor Symphony made the list.

Much of the current strength of Open Access is that it is operating on several non-IBM-compatible PCs. It is being sold in large numbers to the New South Wales Health Commission, which has a large order for NEC APC IIIs. The NSW State Government is also running Open Access on its Apricots.

Software Suppliers hopes to capitalise on the product's good showing when it releases Access 4 in August. The module is the first of at least six, which will ultimately form Open Access 1.1. Access 4 is a spreadsheet with graphics, a text editor and a simple information manager. It will also have some Sidekick-type functions: users press F8 to reveal a calendar, a clock with three time zones, a full scientific calculator, an alarm and stop watch, a scratch pad, a name and address file and a diary.

Bruce Lamb, managing director of Software Suppliers, says that at \$495 the package will introduce more people to Open Access.

David Johnstone, managing director of Opsoft, the local distributor of Enable, agrees that the price of integrated software is high, but he does not see any value in unbundling. Enable is the newest and the least-known of the integrated packages, but already Opsoft is preparing the launch of version 1.1. ■



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IBM PC v. Apple Macintosh

**Can the Mac take on
Big Blue in the
business market?**

By Diane Burns and Sharyn Venit

Apple's claims aside, the Macintosh will never really replace the IBM PC as a serious business machine, right? If you believe this, you are probably one of the many PC users who have never really seen or touched a Macintosh. Or perhaps you formed this opinion before the 512K memory, hard disk drives, and the many business software packages were available for the Mac.

Today, Apple Computer is waging an accelerated campaign that is aimed at selling the Macintosh to business users. In the pages that follow, we look seriously at Apple's claims and compare the Macintosh to the PC as a viable business machine. To separate the facts from the myths, we subjected the two to a series of tests with five basic applications that are available for both machines: word processing, spreadsheets, database managers, business graphics and drawing.

Unfair to the PC, you say? How can we match the PC's 16-bit processor against the Macintosh's 32-bit configuration? Although you would expect the 32-bit machine to run faster, you have all heard how slow the Mac's operating system is with disk I/O. And if you are accustomed to working with other computers, you may laugh as you hum along with the Mac's disk drive, waiting for files to open or close. Have you heard the one about how Apple provided these pauses to give you a moment for thought?

Unfair to the Macintosh, you say? How can we put the four-year-old child of a giant in the same ring with a one-year-old baby whose parents started out in a garage?

If you have been thinking along these lines, you may be surprised at some of our test results. Once we began, we honestly had to ask ourselves whether the PC is as "mature" as we thought it was, or whether it is actually becoming outdated? Is the Macintosh a fad, or is it the direction of the

PC V. MAC

future? We have had to acknowledge, too, that three years ago the PC suffered from a lack of software.

Here is a list of the applications and related products that we compared:

PC		MAC
	Word processing	
Microsoft Word		Microsoft Word
	Spreadsheets	
Lotus 1-2-3		Crunch
	Database managers	
Powerbase		Omnis3
	Business graphics	
Microsoft Chart		Microsoft Chart
	Drawing	
DR Draw		MacDraw

Wherever possible, we used the same manufacturer's software on each machine. We found, however, that a package with the same name and manufacturer does not necessarily mean the same product. Sometimes, for example, handy features implemented for one machine were inexplicably missing in the program released for the other. In other words, sometimes a program's limitations related less to differences in the hardware's capabilities than to the incomplete design of the software.

This brings up an important issue: how long a product has been on the market. The longer it has been out, the more comments and criticisms have come back to the manufacturer, and the

more it is likely that later versions have eliminated annoyances and incorporated improvements. Product maturity, therefore, applies not only to the machines themselves but to the software, too. So as we uncover our findings, bear the age difference in mind.

As you will notice in the tests that follow, we strove to compare like features similarly implemented and to avoid comparing widely different aspects of the programs. For instance, we do not discuss installation procedures.

In all cases, the standard tests simply timed the execution of three common operations: loading a program, saving a file, and opening a saved file. We also noted the number of keystrokes required

The machines

To compare the PC and the Mac as closely as possible, we used 512K machines in each case, then added a mouse, a graphics card, and a color monitor to the PC to run the graphics programs. We also attached a modem to each machine, which required us to add an AST board to the PC. The remaining differences in hardware result from the different guiding principles behind their initial designs and the different prevailing state of technology at that time.

In one area especially, the design principles behind the two machines are radically different — something that quickly becomes apparent when a user

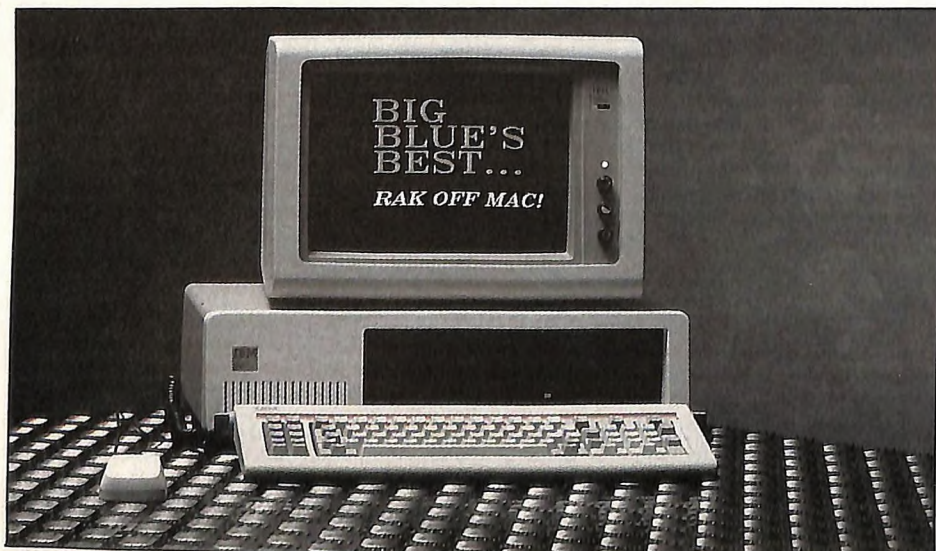
needs to expand a system beyond the manufacturer's basic configuration. The IBM is expandable by design. With its built-in expansion slots, the possibilities for configuring the machine are practically limitless. Almost anything you add to the Macintosh, however, is literally an extra attachment. Even opening Mac's outer casing voids Apple's warranty on the equipment.

Is the Macintosh's closed "black box" what users want? We have passed the stage in the industry where most users loved tinkering with the insides of a machine. After all, how many of us would really tackle installing an internal hard disk? On the other hand, who can

spare the time lost when the machine is at the shop getting an expansion? Why can't we just pick up the needed unit and plug it in like a stereo component?

While open architecture remains a subject for debate, the superiority of the Mac's underlying chip technology cannot be denied. Inside the IBM PC throbs an Intel 8088, while a Motorola 68000 races inside the Macintosh. Apple touts the 68000 as a 32-bit processor, but it is actually an advanced 16-bit processor for most operations. Likewise, IBM called the 8088 a 16-bit processor from the start, while Intel's technical literature describes it as an 8-bit processor. (It has a 16-bit register but uses an 8-bit bus.)

Newer and more advanced, the Motorola chip has a larger instruction



PC

Processor:

Intel 8088 (16 bit)

Clock speed:

4.77 MHz

RAM:

512 KB (256K on AST board)

ROM:

40 KB

Video display:

11" color, 640 × 200 pixels

Disk storage: 5¼" disk double-sided/360K

Serial ports:

One with AST board (add-on)

PC V. MAC

for a particular operation, and, in some cases, the actual time it took to enter the keystrokes. The time it took to execute the stated task is given to the tenth of a second.

In addition, we selected two or more characteristic operations for each application and presented the comparative results for each. For example, we timed a search-and-replace operation using word processors and a recalculation using spreadsheets.

When counting keystrokes, we simply counted a "mousetroke", or double-click, as a keystroke command. A mousetroke typically takes more time and movement than a keystroke, and there is inevitably a variation in operator

speed. Because of this variation and because of the time it took to enter a keystroke often made no significant difference, we finally chose to present only the execution times in the charts, which we averaged over three trials.

We used a color monitor and graphics card with the PC to display graphics but made no attempt to compare the full range of output devices available for the two machines. For example, we did not take into account the many options already available for PC output to color printers and plotters, 35mm film cameras, and video output. Similarly, we did not compare the PC's "best possible" output to a laser printer against the Mac's refined type styles — available through Apple's LaserWriter printer,

which incorporates typesetting fonts such as Times Roman and Helvetica.

Those who have had no experience with computers — or those whose opinions are based on media coverage — often see the Mac as friendly and the PC as intimidating. Indeed, there are many significant differences between the two machines that fall outside the realm of benchmark testing. With this in mind, we dispersed subjective evaluations throughout our discussion.

We began by comparing the nuts and bolts of each machine. In what follows we discuss the hardware components feature by feature and sum up the results in a chart.

What, then, is the difference between a 512K PC and 512K Macintosh?

set that processes more work with less code. Much of its power supports the Mac's considerable graphics overhead. The Intel 8088 chip, however, has been around longer, and a great deal more is known about how to make it perform to its fullest capacity. For this reason, it will be around for some time to come — supported by the large and still increasing number of 8088-based systems in use.

The PC AT's 80286 would have made a better comparison against the 68000, but the AT isn't exactly the desktop norm.

Most IBM PCs in regular business use now have a minimum of 256K, and 512K is common. Some damage was done to the Mac's reputation as a business machine by its introduction as

a featherweight 128K RAM machine. Now that the Mac has a greater memory capacity, the question is how soon will even more memory be affordably available for both machines. Numerous companies are interested in seeing the PC function comfortably with a megabyte or more of RAM, but there is considerable interest in giving the Mac a mega-memory, too.

The question of ROM, or internal built-in memory, is slightly different. While the PC's internal 40K ROM provides a sophisticated structure for addressing the machine's various components, Macintosh's slightly larger 64K ROM helps it support the extensive memory overhead that the easy-to-use graphics interface demands. In fact, developers trying to produce a Mac-

intosh-like interface for the PC find the job more complicated because of the PC's CPU and ROM deficiencies.

Like its chip technology, the Mac's more advanced disk drives reap direct benefits from technological advances made since the PC was originally designed. The Mac's 3½-inch Sony drives read their tiny, data-packed disks at variable speeds. One single-sided 3½-inch floppy stores more data than a double-sided 5¼-inch floppy and fits into a shirt pocket.

The 3½-inch floppy is encased in a rigid, nonremovable plastic sleeve with a sliding metal shield over the accessible part of the disk's magnetic surface. These disks are far more rugged than the 5¼-inch floppy. Furthermore, exper-



MAC

Processor:

Motorola 68000 (32 bit)

Clock speed:

7.83 MHz

RAM:

512 KB (built in)

ROM:

64 KB

Video display:

9" black & white, 512 x 342 pixels

Disk storage:

3½" disk, single-sided/400K

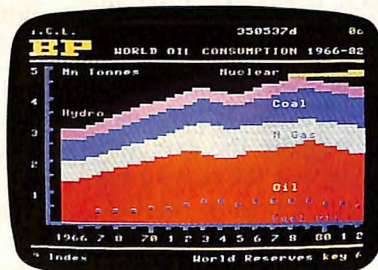
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PC V. MAC

ience has convinced us that approximately one out of 20 new 5¼-inch floppies are not usable because of BDOS errors in the formatting. In addition, we have formatted almost 100 of the Macintosh's floppy disks, and every one of them worked the first time and is still usable.

The Macintosh comes with a mouse, of course, and for all of our tests we used Microsoft's mouse on the PC with those programs that were capable of supporting a mouse. Generally, cursor movement by mouse tends to be rather jumpy on the PC screen, whereas it is smooth on the Mac. However, the difference didn't bother us very often since most of the programs we tested on the PC could not be used with a mouse.

Although the Mac's stripped-down keyboard is important for the machine's transportability, the mouse alone does not match all of the advantages of the

PC's function keys and a numeric keypad (you can attach one separately to the Mac). Moreover, the Mac's screen is rather slow to display characters as they are typed in through the keyboard. Speed typists will prefer the PC keyboard, which offers a far more satisfying tactile response and displays typed characters far more quickly on the

There is virtually no comparison in screen resolution between a standard PC and a Macintosh. Viewing the Macintosh's 512 x 342 pixel resolution next to the PC's 80-column by 25-line screen makes the PC's screen look crude in either the text or the graphics mode. We used a standard IBM graphics adapter and an IBM color monitor for normal graphics on the PC, though we could have achieved higher resolution with IBM's Enhanced Graphics Adapter and monitor (however, the EGA has a long, long way to go before it becomes

the hardware and software standard for the PC).

The other obvious difference between the two machines is their screen size. Although the Mac's 9-inch screen can seem rather cramped at times, the size is less troublesome than it might be on a lower-resolution screen. You can choose to view more of a file on one screen by selecting a smaller type size for text or spreadsheet entries, and with MacDraw you can scale the image down to fit a full 8½ by 11-inch printout, or you can create a larger image on the small screen.

Although facts and figures are one thing, performance is quite another. That is the reason why we will next take a look at both the measurable and subjective differences between the PC and the Macintosh as they run some of the most commonly used business software available on today's market.

The tests

Word processing

Since word processing is probably the most common application for personal computers, a slow or awkward program affects overall productivity. Because word processing, for most people, is part of their daily work, we chose it to begin our comparison.

We were able to test word processing with the same product on both machines: Microsoft Word. The PC version of Word was first released in November 1983; in these tests we used the latest version, 2.0, which, along with the Microsoft mouse, was released in January 1985. The first Macintosh version of Word, released that same month, was the one we used for our tests here.

To test word-processing abilities, we built the same three-page, 11,538-character (11K) document on each machine. Besides the standard tests (load program, save data, open saved file), we measured the time and keystrokes required to search and replace a string of text and to change the margins for the whole document.

The data entry process was fairly straightforward on both machines: once

the program was loaded, we simply began typing. Both machines offer some common formatting commands (bold and italics, for instance) as menu selections. The PC version, however, also lets you over-ride the menu and key in the command. Truly useful programs should offer both of these options: a helpful menu for beginners, with keyed command alternatives for more experienced typists who may not want to use the mouse.

The fact that these common formatting commands are available only through a menu on the Macintosh is a limitation of the word processor's program code rather than a fault of the hardware. (MacWrite, for example, includes keyboard command alternatives to the menu for bold and italics.) Perhaps later versions of Word for the Mac will incorporate some of these missing conveniences.

Although Microsoft Word, as designed for the PC, allows you to select different type sizes and styles, what you see on the screen is not necessarily what you get in print. For example, italics and boldface may appear as such on the

screen only if you have a graphics card. Even with a graphics card, all fonts appear as the standard serified font you are accustomed to seeing on the screen, and all type sizes appear to be the standard screen character height until they are printed. On the Macintosh, not only do you see each type style displayed exactly as it is, but you also have a wider range of styles and sizes to choose from.

Because of its built-in clipboard cut-and-paste facility and bit-mapped screen, text documents on the Macintosh can include charts and pictures pasted in from charting and drawing programs. This capability is still not widely available on the PC; Enable is one of the few PC programs that can do it.

On the other hand, while the Macintosh version of Word does have full

PC product	Mac product
Microsoft Word v2.0	Microsoft Word v1.0
Price	Price
\$595	\$365
Requirements	Requirements
256K	128K
Supplier	Supplier
Microsoft	Microsoft

PC V. MAC



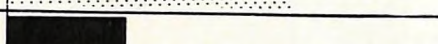

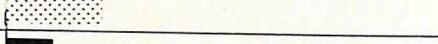
print-merge capabilities — an absolute necessity in our view — it does not contain a spelling checker. Some potential Mac users would miss the excellent Spell program in the PC version. Though both versions offer a wide variety of output device drivers, the list for the PC is much longer.

It is possible to send a text file from the PC to the Mac and vice versa, but the transfer is not as direct as you might expect. On the Macintosh, you must first save the file as "text only" — that is, none of the character formats available through Word are preserved, and the file is sent as a simple ASCII file. To obtain an ASCII file with the PC version, you must print the file to disk with the printer type "PLAIN" selected.

Conclusion

We were surprised to find that in every timed test the two machines were rather close, with the Macintosh coming in slightly faster on most tests. Furthermore, since Word for the PC is moused, most common operations were equally easy to perform on either machine. Finding the two machines comparable, we would stay with whichever one we started out on — neither system offered anything worth switching for.

•BENCHMARK TESTS•

Operation	Number of keys	Time in seconds							
		0	5	10	15	20	25	30	35
Load the program	PC [2]								
	MAC [2]								
Save the file	PC [3]								
	MAC [1]								
Open the saved file	PC [3]								
	MAC [3]								
Search and replace	PC [3]								
	MAC [3]								
Change margins	PC [6]								
	MAC [4]								

In all the word processing tests, the longest operation was loading the Word program itself. It also showed the biggest difference in time between the two machines: 33.67 seconds on the PC versus 22.00 seconds on the Macintosh. Saving the final text file was the second-longest operation, taking three keystrokes plus an average of 25.61 seconds on the PC, and one keystroke plus 22.03 seconds on the Macintosh. Once we saved the file, we opened the saved file from within the program. In both cases this operation required three keystrokes, but once again the Macintosh came out slightly ahead in time: 9.16 seconds for the PC versus 8.88 seconds for the Mac.

When it came to margin resetting the Macintosh came out ahead on two counts. On the PC this task took six keystrokes (12 seconds keying time) plus 4.26 seconds execution time. On the Macintosh, the same operation required four keystrokes (with a keying time of 9 seconds) plus a 3.13-second execution time. In the search-and-replace test the PC took longer to execute the command (8.55 seconds). It required three keystrokes plus the search/replace string characters (an 8.17-second keying time). Like the PC, the Macintosh required three keystrokes but took an average of 10.19 seconds to key the search/replace string characters, plus a 7.52-second execution time. The net effect was that although the Mac's execution time was faster, keying may take so long that the PC comes out ahead.

Spreadsheets

Along with word processing, spreadsheets are one of the most commonly used applications on any personal computer. Because they are used so frequently, speed can become more important than menu convenience in performing basic operations. Screen resolution and color capabilities are less important to spreadsheets (at least in this comparison, where we have put business graphics under a separate heading). And although the ability to see negative numbers displayed in red is sometimes handy, we rarely print spreadsheets in color.

It was natural to select Lotus 1-2-3 for the PC application, since it is the most commonly used spreadsheet on the market. Our choice of spreadsheet for the Macintosh, however, deserves some explanation. During the first year the Mac was on the market, the only spreadsheet available for it was

Microsoft's Multiplan. When we began conducting these tests, other spreadsheets were about to be released, including Lotus's version of 1-2-3 for the Mac, Jazz, and Microsoft's Excel for the Mac. To compete with the heavyweight 1-2-3, we wanted as powerful a package as possible. We looked for one with a large number of built-in functions as well as speed. Visicorp-Paladin's Crunch seemed to fill the bill, with its 74 built-in mathematical functions and its 250-column by 9999-row worksheet.

Like 1-2-3, Crunch includes both

graphing and database management functions, which we did not test for this review. Although the pre-release version we used still contained some frustrating bugs, it was able to complete the necessary tests.



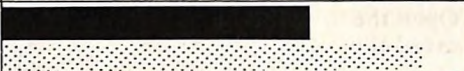


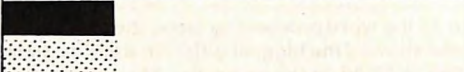
In addition to the standard tests (load program, save data, load saved data), we measured recalculation speed for two spreadsheets on each machine. Each spreadsheet consisted of a 25-row by 25-column matrix of entries: one included only addition formulas; the other, only multiplication. In both cases, the result in each cell depended on the value calculated for the immediately preceding cell.

We found the Mac's mouse very handy for selecting cells and making spreadsheet entries, although on the PC similar cell selection could be accomplished by using the four arrow keys. Crunch made full use of the Mac's iconographic menu capabilities,

PC product	Mac product
1-2-3 v1A	Crunch (pre-release)
Price	Price
\$835	N/A
Requirements	Requirements
192K	512K
Supplier	Supplier
Imagineering	SCA

PC V. MAC

•BENCHMARK TESTS•

Operation	Number of keys	Time in seconds
		0 5 10 15 20 25
Load the program	PC [4] MAC [2]	
Save the file	PC [4] MAC [1]	
Open the saved file	PC [4] MAC [3]	
Mult. test (recalc by adding a new number)	PC [2]+ MAC [2]+	
Add. test (recalc by command)	PC [1] MAC [1]	
Mult. (recalc by command)	PC [1] MAC [1]	

Lotus 1-2-3 loaded into the PC 3 times faster than Crunch loaded into the Macintosh: 14 seconds on the PC versus 45 seconds on the Mac. Saving the data required only one mouse click on the Mac (0.4 seconds) plus 19 seconds of execution time. On the PC it took four keystrokes or 2 seconds to enter the Save command, but the save operation was completed within 14.5 seconds, giving the PC a net lead over the Macintosh. The last of our standard tests — loading the saved file — required 17.25 seconds on the PC and 23.5 seconds on the Mac.

On both machines, the Recalculation command required only a single keystroke, though the PC's keystroke took less time to perform than the Mac's mouse click equivalent (0.13 seconds versus 0.65 seconds). Once the command was entered, execution times for recalculation were nearly identical on both machines for addition and multiplication: roughly 5 seconds in all cases.

letting you fill down or fill right with a single mouse click.

The Mac's small screen can be a disadvantage in building large spreadsheets, but to fit more cells on the screen, Crunch lets you select from a wide range of type styles in sizes as small as nine point. Scrolling with the

Mac was slower than using the Page Up/Page Down keys on the PC. For many users, a numeric keypad is a must for convenient data entry. Such a keypad, although not standard on the Mac, is available separately as a peripheral. It works almost identically to that on the PC.

Although we compared charting abilities using a stand-alone graphics package under a different heading in this article, it is worth mentioning here that it is much simpler to create a graph with data from Crunch than from 1-2-3. With Crunch, you simply select the cells to be graphed and click the mouse on one of the chart icons shown in a menu bar across the top of the screen. With 1-2-3, selecting the cells to be graphed is more cumbersome, and you need to change disks to view the graph.

You can transfer spreadsheet data between the two machines and load it from almost any originating spreadsheet into almost any target package. It is conceivable, therefore, that a big office could use different machines and still merge spreadsheet data when necessary, but the conversion is cumbersome. In all cases the spreadsheet data must first be converted to DIF, SYLK or ASCII formats before it is transmitted, then converted back to spreadsheet format at the other end.

Conclusion

Spreadsheets on the Macintosh can be more powerful and easier to use than on the PC. Our preliminary results indicate that the PC may be in for some stiff competition in the spreadsheet arena, especially if spreadsheets on the Mac are able to eliminate the one or two-day training period required for the novice user to learn 1-2-3 on the PC.

Database managers

For both mainframes and mini-computers, the database management application is the most essential — far more so than word processing, or spreadsheet number crunching. With personal computers, it seems to work the other way around.

Many of us can do everything we need to do with a word-processing package and a spreadsheet, however it takes a certain degree of maturity — or specific business need — to decide to build databases. They are, after all, the most difficult common business application for users to learn. Computer system consultants are often called in to design the

database, generally with the intention of making the program easier for the office staff to use. We were especially curious, then, to see how the Mac's acclaimed "friendliness" carried over into this highly complex application.

We selected Powerbase for the PC because it is graphically oriented, powerful, and easy to use. For the Macintosh, we chose Omnis3, a powerful hierarchical database — and one of the first full database systems available for the Mac.

We built a relatively simple database on each of the machines: an invoice file for a dentist's office. The database was designed to pull in data from both the client file and from a file that listed all

the dentist's available services and their charges. We entered 30 client records in each system, 10 services, and a dozen invoices. These data files required 15,504 bytes on the PC, and 15,360 on the Mac. In addition to the standard tests, we measured the time

PC product

Powerbase v2.1

Price

\$795

Requirements

256K

Supplier

Interactive Applications

Mac product

Omnis 3

Price

\$730

Requirements

128K

Supplier

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PC V. MAC

to find a record and the time required to save a new record.

Both these packages enlist an elaborate system of menus and prompts to help you design your database. It was easy to set up the invoice file so that it automatically pulled data from the client and services files as you billed a client. Once the database itself was designed and in place, screen entry was easy and straightforward on both systems.

Some keying conventions took a while to get used to; for example, Powerbase uses the F9 and F10 keys instead of the arrow keys to move around on the menu bar, and Omnis3 forces you to press the Tab key to move from field to field during entry, since the Return key signifies that you are finished with the record. These are peculiarities of the programs that we used, however, rather than any special limitations in the hardware.

We compared the times required to search the database for a particular record. The Mac was faster in both the keying time and the search time, though the two machines can be judged comparable: the Mac took 1.5 seconds to locate the record and the PC took 2.4 seconds. The test of saving a record

		Time in seconds						
		0	1	2	3	4	5	6
Load the program	PC [3]	42.19						
	MAC [2]	31.67						
Open application	PC [3]							
	MAC [3]							
Find a record	PC [8]+							
	MAC [5]+							
Save a record	PC [2]							
	MAC [1]							

The Macintosh took less time to load Omnis3 than the the PC took to load Powerbase: two mouse clicks requiring 0.32 seconds, plus 31 seconds for the command to execute. On the PC, the three keystrokes took 1 second, followed by 42 seconds to load the program. Both database packages save records as they are entered, so we couldn't time saving a file as we did for other applications. Once a database structure is built, however, it can be opened directly. Opening required only three keystrokes in each case, and the execution times were very close: 5.65 seconds on the Mac, 5.89 seconds on the PC.

proved to be an even match: each machine clocked in with a keying time that was under one second, and an execution time of approximately four seconds.

Conclusion

Although there have been many complaints about the lack of, or limitations in, database management

programs available for the Macintosh, Omnis3 proves that there is no reason why the Mac can't handle the DBMS demands of comprehensive business systems. Nevertheless, few products are still available for the Mac in this category, and we still need to wait for the popular consensus to put new products like Omnis3 through more-rigorous tests than ours.

Drawing programs

Of all the applications that we tested in this project, the drawing programs demonstrate some of the Macintosh's most outstanding features and some of the PC's greatest weaknesses. From the beginning, Mac users have enjoyed the ability to create drawings with the MacPaint software that Apple bundles with the Mac. Most PC users, on the other hand, have had little experience with free-form drawing packages. Those that have been around for a while either require the purchase of additional hardware, such as a digitising tablet, or are command-driven and relatively clunky compared to MacPaint's point-click-drag mouse operations.

Some of the newer drawing programs for the PC, which attempt to emulate MacPaint and MacDraw, have iconographic menus and a mouse, but none has matched the flexibility in design and

type styles that are made available by the Macintosh's high-resolution screen.

For this comparison, we chose MacDraw rather than MacPaint, since MacDraw is an object-oriented drawing program that lets you rearrange text and graphics on the screen easily. For the PC, we selected DR Draw by Digital Research because its features and operation are more similar to MacDraw's than are those of any other PC package available.

DR Draw, which has been out since January 1984, still carries the original

release number, 1.0. MacDraw was not released until March 1985, but its predecessor, LisaDraw, had been around for several years. Earlier beta versions of MacDraw have been around for so long that the first official release is, in fact, Version 1.7.

We used each program to draw a simple four-person organisation chart. In addition to conducting the standard tests, we measured the amount of time and number of keystrokes required to change the orientation for the printed image from "tall" to "wide", turn the grid or ruler on, move a box on the screen, and change the size of the type in a heading.

The drawing process itself was much faster and simpler with the Mac. Menu selection functions that required one step on the Mac required one or more additional submenu selections on the PC. On the Mac, we could move an

PC product	Mac product
DR Draw v1.0	MacDraw v1.7
Price	Price
\$499	\$180
Requirements	Requirements
Graphics, 128K	128K
Supplier	Supplier
Arcom-Pacific	Apple Computer

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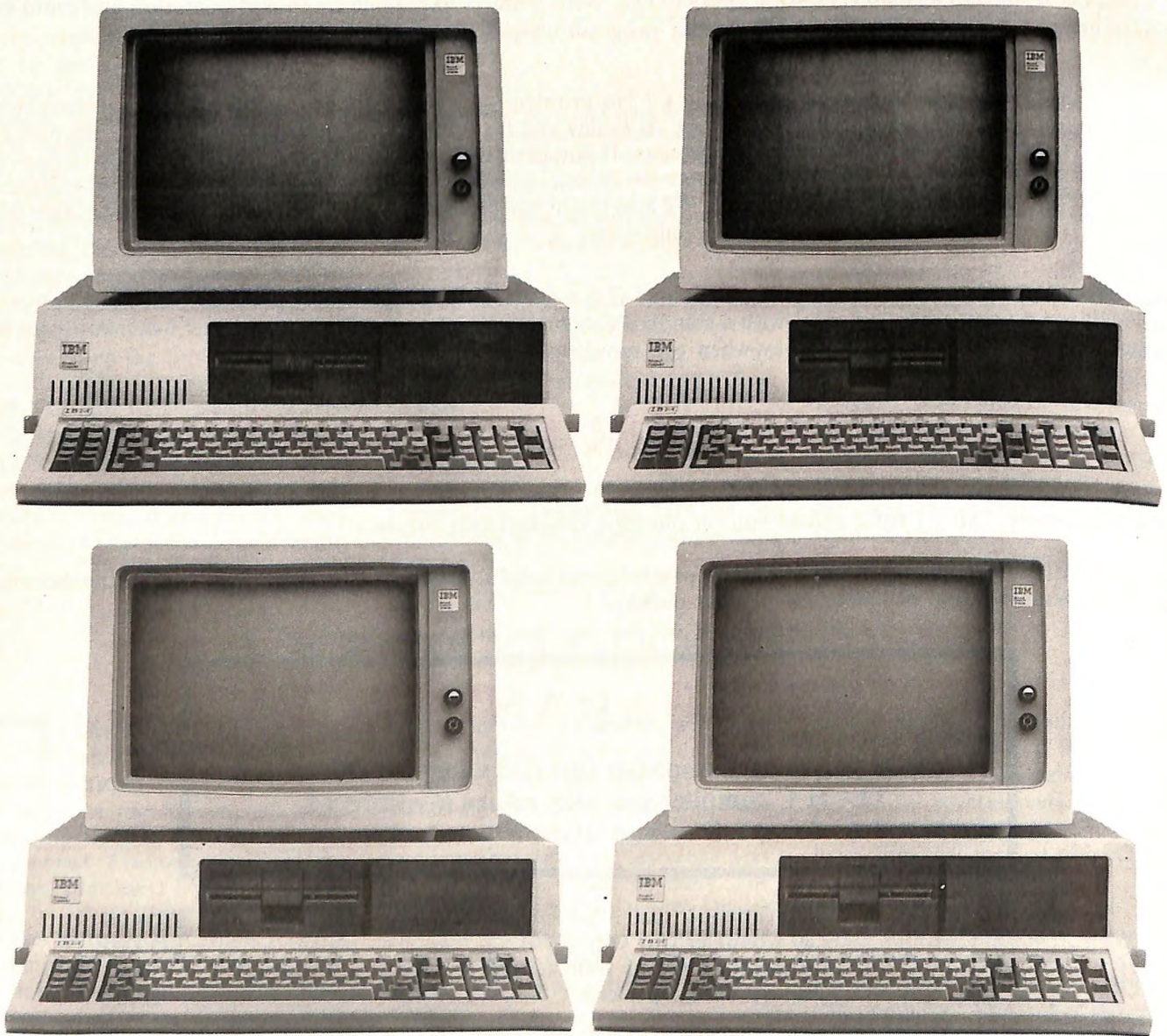
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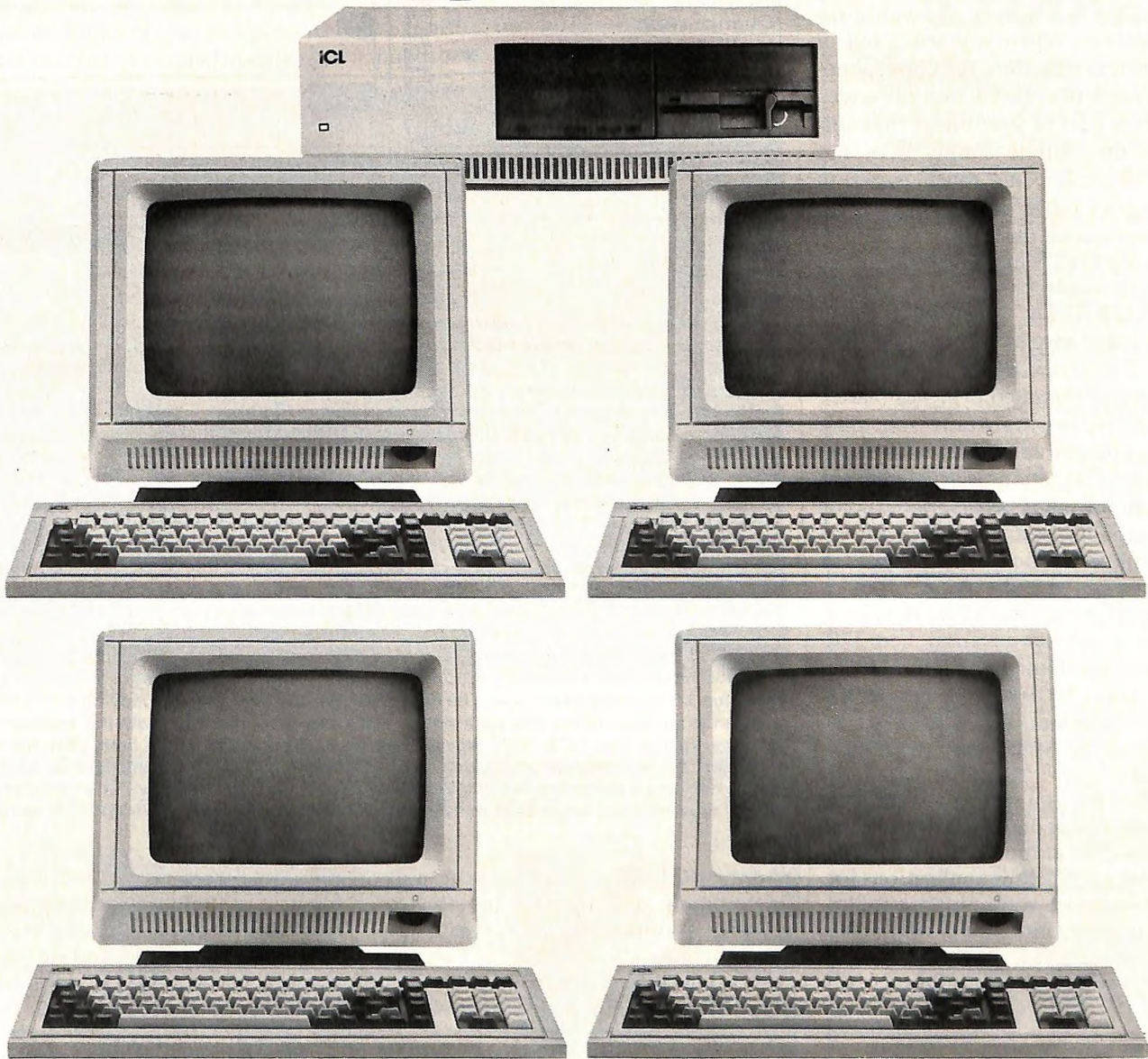
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PC V. MAC

object on the screen by simply clicking and dragging the mouse, whereas DR Draw required us to mark the target co-ordinates and then wait for the program to move the object.

Thus the Mac's greater ease in drawing translates into greater artistic freedom and power for the user. For instance, the Mac prints the entire drawing, no matter how many pages it requires. DR Draw prints only those parts of the image that fall within the page outline. When you select tall or wide print orientation, the corresponding outline is dropped in over the screen image; the part of your image that falls outside the outline simply does not print. Moreover, it's much easier to rearrange or resize the full drawing on the Mac than on the PC.

Although the Mac has a wider range of fill patterns to choose from, the PC — with DR Draw — allows at least a limited color display and output. On-screen, DR Draw let us select among only three different colors (plus black). Since color is important for most presentation graphics, the Mac's black-and-white restriction is a significant limitation for many artists. Some color output capabilities are promised for the Mac soon, but none were available for this comparison. The Mac offers a wider selection of type styles. However, type size is another question: here DR Draw lets you define an area to be filled by the text, letting you create an "infinite" number of type sizes, as opposed to the Mac's nine (or fewer) point sizes.

The Mac lets you copy drawings into text files and print out whole documents that include the graphics in stream with text. Some page layout applications for the Mac even let you compose multi-column page layouts with graphics. No drawing packages for the PC are as fully integrated with text as are those available for the Mac. Currently the Mac

•BENCHMARK TESTS•			
Operation	Number of keys	Time in 2 seconds	
Load the program	PC [5]	46.61	
	MAC [2]	46.03	
Save the file	PC [2]	21.80	
	MAC [1]		
Open the saved file	PC [12]	51.74	
	MAC [3]		
Change from "tall" to "wide"	PC [3]		
	MAC [3]		
Turn rulers (grid) "ON"	PC [3]		
	MAC [1]		
Move a box	PC [8]		
	MAC [3]		
Increase font size	PC [9]		
	MAC [2]		

Although it took a few more keystrokes to load DR Draw on the PC than to bring up MacDraw on the Mac, the two programs required about the same amount of time to execute the Load command: an average of 46 seconds. This relatively long loading time is because both programs create rather elaborate screen images in the process.

The Mac was more than four times faster in saving the file — 5 seconds versus the PC's 22 seconds — and could open the saved file nearly 10 times faster than the PC — 5 seconds versus the PC's 52 seconds. Opening the file required as many as 12 keystrokes on the PC, but the actual keying time turned out to be faster than the Mac's three mouse clicks. The screen-building speed that these tests reflect demonstrates the advantage of the Mac's built-in screen processing over DR Draw's need to include a lot of the screen processing in the program code.

The Mac took much longer to perform a change of page orientation from tall to wide: 4 seconds keying time plus 3 seconds of execution time versus the PC's 3 seconds keying time plus 1 second execution. The difference can be accounted for by the fact that the Mac redraws the entire screen after this command, whereas DR Draw simply drops an outline of the page boundaries over the drawing without redrawing the screen.

The Mac won the test for turning the grid or ruler on: one mouse click or 1.5 seconds keying time plus 1.2 seconds execution, as opposed to the PC's three keystrokes or 3.2 seconds keying time plus 1.6 seconds execution. The Mac also won the time tests for moving a box from one location to another on the screen: a simple click-and-drag operation with the mouse took 0.6 seconds versus the PC's eight keystrokes or 12.5-second keying time plus 4.8-second execution. Finally, the Mac was much more efficient in changing the type size for a label: two mouse clicks or 3 seconds of keying time plus 0.83 seconds of execution. To change type size, the PC required nine keystrokes or 12 seconds of keying time plus 9 seconds for execution.

and the PC have no drawing programs in common, and there is no way to transfer graphics images between the two machines.

Of all the different types of programs tested in this comparison, the drawing

programs gave rise to the widest differences in subjective experience. There was no question that creating an organisation chart was faster and simpler with the Macintosh, and the final printout was generally more attractive. This last

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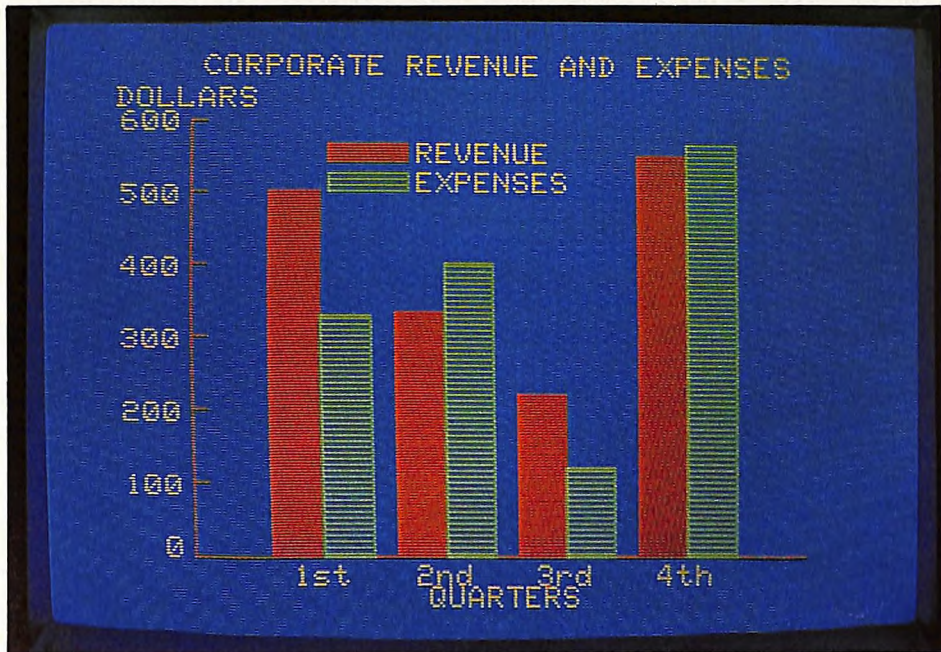
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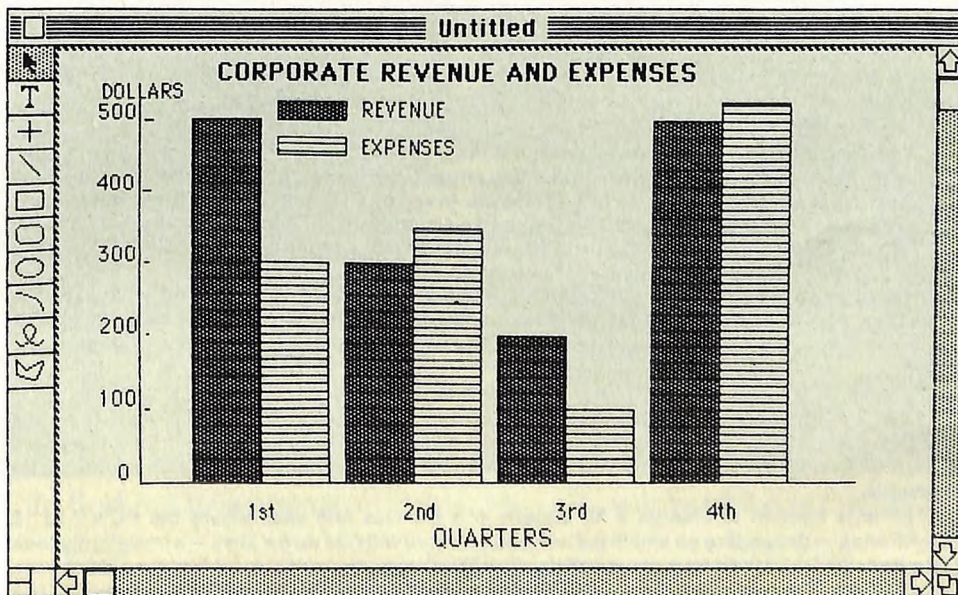
judgment may be debated if we compared the Mac's black-and-white output to DR Draw's printout on a color plotter; but, as we noted in our introductory notes, we made no attempt to evaluate the differences between color and black and white.

In choosing between the two, we would stick with the PC if color were important, but the Mac is the only machine we know of that can produce full black-and-white printed documents

that incorporate both text (in various type styles and sizes) and graphics. MacDraw makes it possible for almost anyone to create charts, diagrams, and business forms easily — you don't have to be an artist, programmer, or type-setting code specialist. Coupled with the high-quality output of Apple's LaserWriter printer, MacDraw's ease of use could have a tremendous impact on corporate in-house production and publishing.



DR Draw on the IBM PC



MacDraw on the Apple Macintosh

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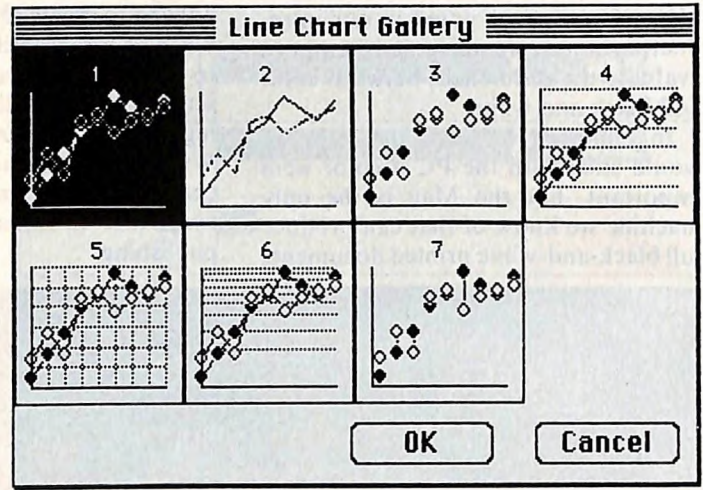
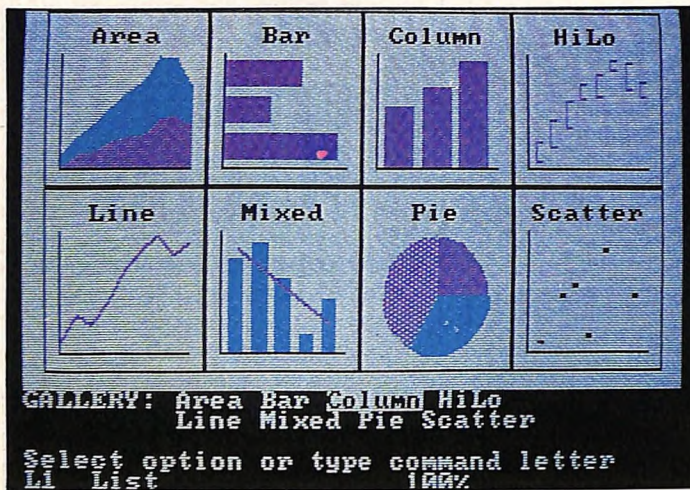
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PC V. MAC

Business graphics



If you are like most, you need charts only occasionally for making a presentation, assembling a financial report, or preparing for sales meetings, so you don't want to spend a week trying to learn how to build a chart. Our examination of business graphics, therefore, includes subjective evaluations that may outweigh the benchmark results.

We were able to use the same program on both machines: Microsoft's Chart. Microsoft has been making a considerable effort to adapt the PC version of Chart to the hardware environment in which it is used. In other words, in low-resolution mode the program will build the most presentable charts possible, but when you add a high-resolution screen and six-pen plotter, it looks even better: Chart automatically adds more type styles and greater smoothing effects, as befits high-resolution graphics.

This test brought us head-on to one of the biggest limitations of the Macintosh: a screen that's black and white only, with (so far) no color output device capabilities. The Mac's high-resolution screen allows for the full range of Chart's type styles and shading options, but only the PC version can output in color. The Mac's high-resolution screen is a big plus, and we personally preferred it to the PC's crude resolution in color. In fact, on a standard PC, Chart is best run in the monochromatic mode.

Many camera devices for producing

•BENCHMARK TESTS•


Operation	Number of keys	Time in seconds	0	10	15	20	25
Load the program	PC [6] MAC [2]						
Save the file	PC [4] MAC [1]						
Open the saved file	PC [4] MAC [3]						
Screen redraw	PC [4] MAC [1]						
Change from bar to column	PC [3] MAC [2]						
Change pattern in a bar	PC [7]+ MAC [4]						

As with the other applications, the longest single operation is loading the program from disk. The loading times themselves were close, ranging between 24.67 and 25.55 seconds on the PC and between 23.76 and 28.56 seconds on the Mac. In number of keystrokes and keying time, however, the Macintosh came out significantly ahead, with two keystrokes that took an average of 0.2 seconds against the PC's six in 1.1 seconds. In saving data, too, the Macintosh beat the PC in time and keystrokes: four keystrokes required an average of 2.71 seconds on the PC, followed by 7.81 seconds of execution time; the Mac's single mouse move required half that time (1.4 seconds), followed by 6.15 seconds for execution.

When it came to opening a saved Chart file, however, the PC was phenomenally faster. But its speed reflects the fact that on the PC, the opening screen displays the data series lists only, whereas the Mac's opening screen includes a drawing of the chart, too. The simpler the chart, the faster the Mac's chart file will load.

To convert the chart from a horizontal bar to a vertical column required only three quick keystrokes (1.98 seconds) on the PC, as opposed to the Mac's two mouse clicks with a forced wait between them, which required 3.8 seconds. After new data was entered, the Mac required only 4.07 seconds to redraw the chart on the screen. This contrasts sharply with the PC's 8.48 seconds.

The time needed to change a fill pattern in a bar was one case where the PC's 7 to 12 keystrokes — depending on which pattern you selected with the arrow keys — consistently took less time than the Mac's four mouse clicks. The Mac however, made up for lost time during the execution of the command. Its ability to redraw graphics on the screen faster than the PC is a direct result of the hardware itself: Apple incorporated the screen-building code directly into the Mac's ROM, whereas Microsoft had to include additional quick-draw coding in Chart to push the PC screen to its limits.



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PC V. MAC

slides or video presentations directly are available for the PC but not for the Mac. This aside, and bearing in mind that color can be one of the most important elements in business graphics, we confined our examination to the chart-building process and the way it looked on the screen, rather than comparing the printed output capabilities of the two machines.

Using Chart on each machine, we built a bar chart that incorporated two data series: 1984 versus 1985 sales in five regional sales areas. Besides the standard disk I/O tests, we measured the time and keystrokes required to change a bar pattern, switch from a bar chart to a column chart, and redraw the chart after changing one or more data entries.

One nice feature of Chart on the Mac is that you can see both the data series and the chart at the same time. Although it is rewarding to see the chart change as you enter or alter the data, this feature is time-consuming. Experienced chartists will want to work with the automatic redraw feature turned off. Without the redraw feature, charting on the Mac is more like working on the PC, which doesn't let you view the chart and data simultaneously or watch your creation change.

PC product	Mac product
Microsoft Chart v1.0	Microsoft Chart v1.0
Price	Price
\$455	\$225
Requirements	Requirements
Graphics monitor, 128 recommended)	128K
Supplier	Supplier
Microsoft	Microsoft

Another major difference between the two implementations is that the PC version does not use a mouse. Instead, for all operations including menu selection, it uses the arrow keys to move the cursor. Our keystroke time trials showed that the Mac's double-click mousestrokes took longer than the PC's commands in several cases, but subjectively we felt that using the mouse made it simpler to, say, select part of a chart, move the legend, or change the typeface of a label.

We did not test another of the Mac's unique features against the PC: its ability to cut and paste between applications easily through its built-in clipboard facility. On the Mac, copying data from Multiplan to Chart, or copying a graph from Chart to Word, requires only two or three mousestrokes at each end of the operation. Since the PC not only requires more steps to copy Multiplan data to Chart but also cannot

copy a chart into a text file, the Mac makes integrated report production a simpler task. This compensates somewhat for its limitations in producing color presentations.

Charts saved in SYLK format on either machine can be telecommunicated to any other machine's Chart program, so the PC and Mac should be able to exchange data quite easily by using Chart. However, we did not test this feature either.

Our purpose here was to compare two versions of a stand-alone business graphics package rather than the charting functions of a spreadsheet program. To do so, we consciously sacrificed the convenient direct connection with spreadsheet data in favor of better-looking, presentation-quality graphics. Of course, both versions of Chart let you link a data series to a Multiplan file, but one feature we missed on both machines was the ability to enter formulas directly as part of a data series for a chart.

If we had to choose between the two machines on ease of operation alone, we would certainly choose the Macintosh for chart building. However, if we wanted color presentations, we would stick with the PC.

The conclusions

Looking beyond the hype of the Macintosh's futuristic dragon-slayer image and IBM's "good old days" with Charlie Chaplin, what is each machine really doing for you? What do you want in a viable office computer? Sooner or later, you must consider the overall ergonomic advantages of each machine.

One of the most talked-about features of the Macintosh is its simple user interface, which makes it easy to learn and to use. The other, on the negative side, is its incredibly slow disk file I/O. As it turns out, both of these statements are exaggerated representations of the truth. As some software manufacturers begin to make the PC seem more friendly, or Mac-like, so too are others finding out how to code applications that make the Mac seem faster.

What this statement means is that the

two machines and their applications are on a course of convergent evolution, with some manufacturers scrambling to release business applications for the Macintosh, while others are designing pop-down and iconographic menus to make the PC's applications more inviting to first-time users.

"Unfriendly" implementations might have lasted much longer on the PC without the market's increasing pressure for simplicity and ease as embodied in the Macintosh. On this score, the Macintosh has an edge over the PC in that its friendly screen designs are built from the inside out. Until a high-resolution screen with built-in processing is available for the PC, much of the "friendly" appearance of its newer programs is simply a face-lift — skin-deep beauty that isn't as easy to work with as you might hope.

Sceptics have tended to dismiss any popular votes made on the basis of friendliness. After all, they say, new users will eventually become experienced and may even become "power users". Others contend that PC users are harder for having gone through the "boot camp" of learning DOS — and that Macintosh users get spoiled on simple software, making it harder for them to overcome psychological barriers to learning more-complex packages. Is the Mac a machine that its users will outgrow? Does its simplicity of operation mean that only simple functions are available? Will its ostensibly wonderful user interface eventually become a hindrance to productivity? These are difficult questions.

No one should underestimate the destructive effect that intimidation can have on learning. An application that is

PC V. MAC

easy to learn not only takes less training time for your staff, but also makes it likely that once they learn the simpler options they will explore the more advanced ones on their own. Moreover, the ease-of-use factor may have a more immediate impact at the management level than at the clerical: in big corporations, the support staff has been working with word-processing computers for years, but executives who are still working with pens on paper qualify as truly first-time users. Experienced users at all levels would be able to delegate Mac-based tasks to support staff much more quickly than they have been able to delegate similar PC-based functions in the past.

Menu-driven software on any machine may always seem slow compared to software that relies on command languages and keyboard macros. But the slowness of menued commands is often a purely subjective experience, possibly because we don't experience the time passing when actively inputting long commands, while menu operations force us to be idle. The best programs on either machine let advanced users graduate from the helpful menu prompts to keyboard commands to gain speed.

The Macintosh, which makes it so easy to create even such complex business graphics as financial diagrams and Gantt charts, then lets you copy them directly into text files, will probably prompt a greater demand for these visual aids from all quarters, including PC users. The IBM PC's support of color, at whatever resolution, is a big plus; color is essential in engineering applications and vital to business presentations. The Macintosh screen does not support color at this time. However, for as long as color monitors have been available, they have had relatively little impact on the office environment, except for presentations.

One subjective judgment that came as a surprise was that the Macintosh's black-on-white screen image is less tiring to read than the darker images of the PC's color monitor. Although we didn't take any exact measures of how long a person could sit at each screen before taking a break, we observed that people using the color monitor needed more breaks than those on the Mac. In verbal reports they attributed this difference directly to eye fatigue. We find that eye-strain associated with using color makes



it more of a minus than a plus for many applications like word processing and database management. Finally, there is no really economic way to output color, especially if you need multiple copies.

We didn't look at another one of the strongest categories of tools available for the Mac: thinking tools and planning aids. We're likely to see more of this type of application for the PC in the future. Until now, the complexity and slowness of project planning aids on the PC has limited their development to technical fields like engineering and software development.

Of course everyone thinks the Mac is generally more fun — sexier than the PC — but can it ever really replace the PC in the office? There is no question that the Macintosh introduces some incredible possibilities for graphics and typeset-quality text that the IBM cannot duplicate at present and may not be able to match for some time to come. But products like Microsoft's Word are

gradually adding more type styles that take advantage of PC-compatible laser printers.

Meanwhile, our fantasy for the office of the future is to have the PC and Mac work side by side, each doing what it does best. Until the two technologies have truly merged, large offices may find it convenient to use both machines. With the new IBM card that Apple announced at its January 1985 stockholders' meeting, this may not be a fantasy. Is it too soon to judge?

With the growing competition, we can look forward to some amazing developments for both machines. Let us simply concede that as the world changes, so will our view of it — and that this is probably not the last time we will look at the PC versus the Mac. ■

Diane Burns and S. Venit are IBM PC power users as well as Macintosh aficionados. Their book, Mac at Work, was recently published by Wiley Press in the US.

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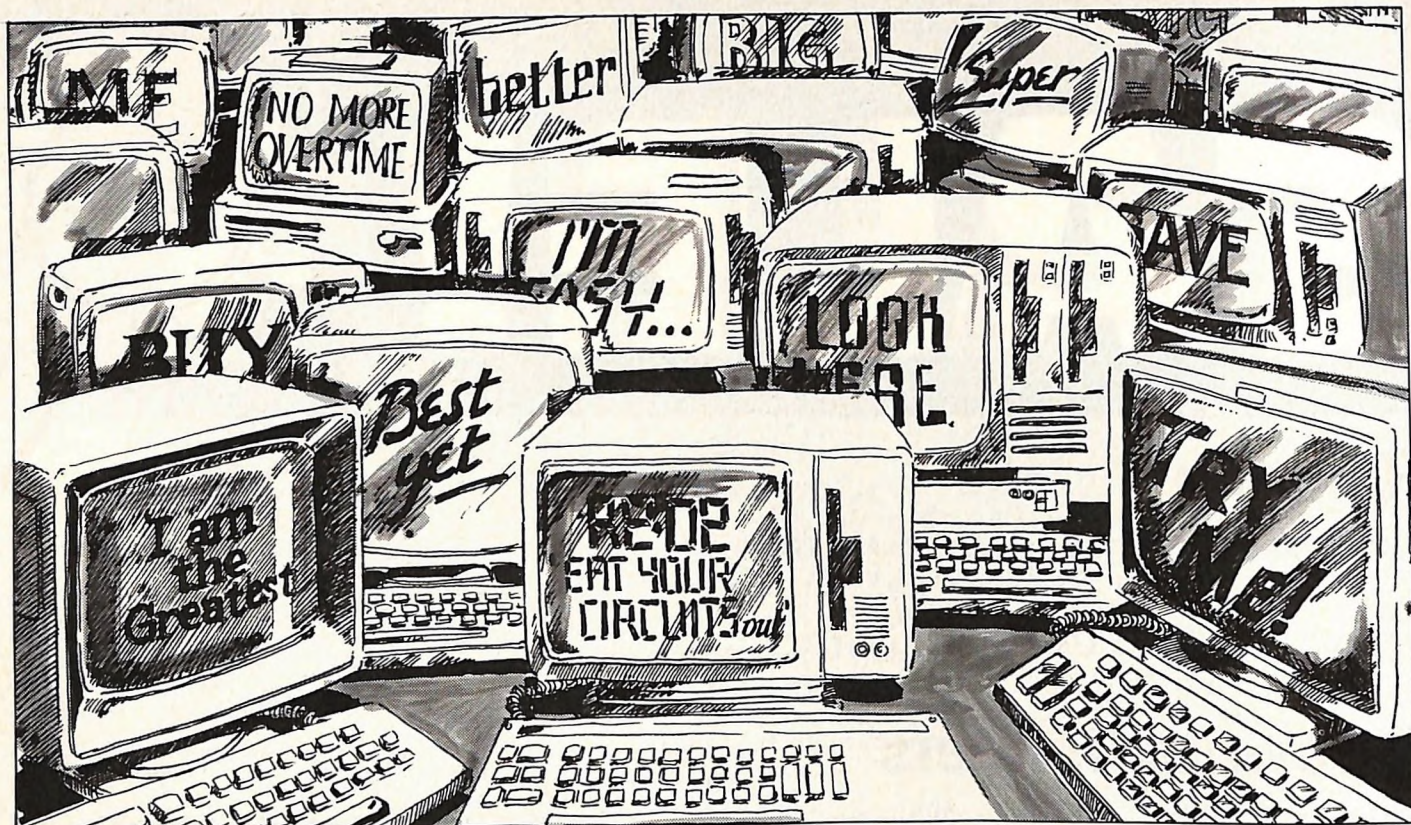
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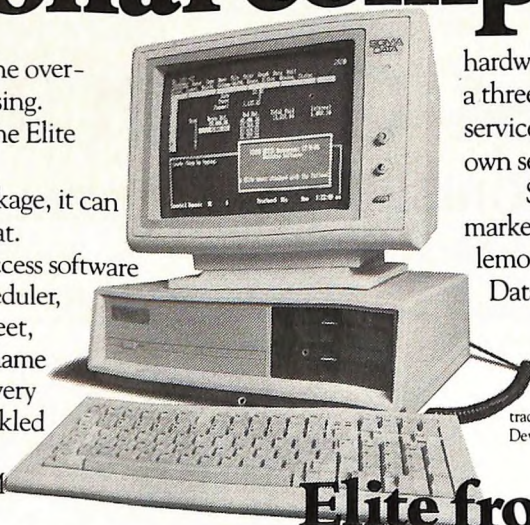
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Publisher sees scope for local software

By Pamela Williams

New applications offer plenty of opportunities for the Australian industry

The Australian software industry is about to get a shot in the arm in the form of a new publishing operation led by the former editor-in-chief of the Book Company, publisher of such successful consumer guides as *The Book of IBM Software* and *The Book of Apple Software*.

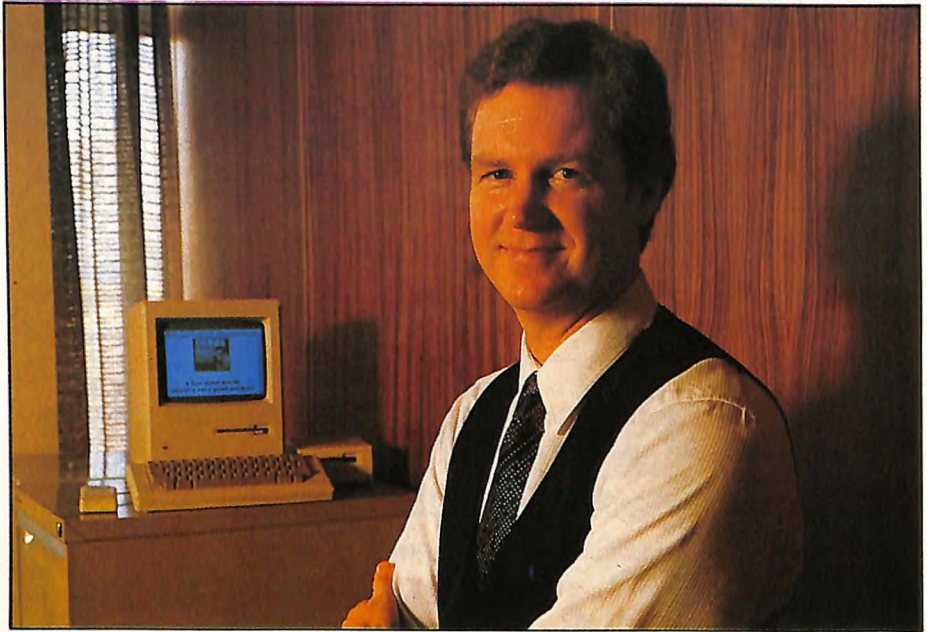
Robert Wells, the software publications manager for Software Corporation of Australia, believes the Australian scene is ripe for a bite at the international publishing apple.

Describing software publishing as the coordination of a total concept of software, user guides and packaging for specific markets as well as the development of consumer guides for the general buyer, Wells says he was recruited to the Australian scene because he has particular publishing skills which are lacking here.

Fresh from the shakeouts in the US market, he is in a good position to run an experienced eye over the Australian market and he thinks there is room for a strong indigenous software market here.

"I come from a market which is absolutely huge, but in Australia you find that there are almost no publishing companies of note," he says. "I think there is a lot of room. Writing software requires a great deal of ingenuity, imagination and creativity, and these are all areas in which Australian software authors are particularly good."

The concept of Australia's geographical isolation is beginning to fade as the influence of the Pacific region, including



Robert Wells: Australia is an excellent test base for new products

such players as the Japanese, begins to take shape in the development of systems for niche or vertical markets.

Wells thinks that Australia is now well situated geographically, with the Asian markets around the corner and the potential Japanese demand for software for the new MSX machines.

He says that while America has saturated the world with software for particular vertical markets, products such as the MSX computers, aimed at the home market, will eventually absorb large quantities of new applications.

A great deal of educational software has already been produced, but SCA expects the market to broaden to cover the business arena and is making plans to be in on the supply side with Australian software. Wells is holding talks with the Japanese to discuss the potential for producing spreadsheet and general accounting packages for business use on the MSX machines.

According to Wells, Australia is an excellent test base for new products. He

says there are two reasons: "First, Australia has an extremely sophisticated user base, which is recognised by the US, and second, if the product fails the repercussions are less severe, so we tend to be in the forefront of the international launch these days."

Although the hardware manufacturers have developed their own software in the past, Wells says the tendency by companies such as Apple to support local software development for its products is a sign of the times.

SCA intends to cover the range of software publishing opportunities and has already begun looking among the IBM and Apple PC user groups for suitable software. Wells says he evaluates the suitability of software initially by sending out a questionnaire covering its target areas, perceived competition, and general information about the system. This will be followed by a demonstration of the system and a decision about publishing.

SCA launched one of its first pub-

THE INDUSTRY

lishing efforts at the PC 85 show this year, a touch-typing education system called Touch.

Wells found himself in the computer industry almost by default. He has a PhD in English literature from the University of Edinburgh where he studied 15th and 16th century Scottish and English literature with a thesis on middle Scots humorous narrative verse.

A lanky Californian who prides himself on having once been seen as one of the emerging younger poets of Scotland, Wells happily confesses to having gone to UCLA in the 1960s to avoid the draft. "Those were turbulent times and university was an acceptable alternative," he says. "I studied English literature and earned pocket money by playing in a rock and roll band."

After completing his PhD, Wells found his Scottish visa was up and he returned to California, where an old friend from his rock and roll days, Beau Vrolyk, now president of Arete Computer Systems in Silicon Valley, advised him to get into the computer industry.

"Beau said to me: 'If you're a warm body and you can write, the computer industry needs you.' And so with some assistance from him I landed a job as a technical writer documenting computer systems for Continental Software. The computer industry is remarkably young and volatile and it was about that time that the PC industry took off and sales went through the roof.

"You pick up the jargon fairly quickly and I had no problems. Continental had a sister company called the Book

Company which had one publication, *The Book of Apple Software*, which was important because as a consumer guide to software it put together ratings on the software and was used by dealers as well as people in offices."

Within a short time, Wells became the editor and publisher of the Book Company and the organisation grew, putting out such titles as *The Book of IBM Software* and numerous others. The meteoric rise of the fortunes of the Book Company coincided with the takeover by Arrays Inc of Continental Software, and Wells became a vice-president of Arrays in charge of publications.

As company turnover grew from \$2 million to more than \$9 million in 18 months, Arrays went public. Wells says this was about the time a cold wind hit the computer industry in the US — the shakeout of last year. Sales fell, the pie was divided up more, and the high-tech industry that had been the darling of Wall Street began to fade.

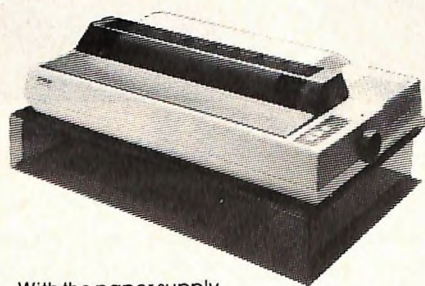
As Arrays contracted heavily, Wells left and began consulting documentation work and planned a holiday in Australia. "While I was here I looked around with a view to starting a magazine, and shortly before I was due to return to the States, Software Corporation of Australia sought me out to discuss software publication," he says.

As software publications manager for SCA, Wells is in touch with dealers and is looking closely at the needs of the Australian industry. "We intend to fill the niches with locally made software in certain vertical markets. Software publishing covers many areas, from the programs on disk, the technical manuals and the boxes, through to the warranty and surveys of users," he says.

While the US computer industry has suffered such a massive shakeout, Wells doubts that it will flow on with any severity in Australia. He believes it was the flattening out of a disproportionate growth curve rather than a collapse of the industry as such.

"The growth is clear in Australia now. The country is urbanised. People are used to high-tech equipment. Per capita I think there are more computer owners here than in America and the picture is looking very healthy indeed for publishing software."

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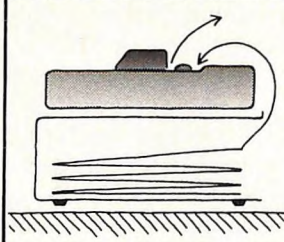
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Sharp looks to the market

Database provider IP Sharp has a simple approach to the often very complex task of building a data service: ask the user. This "market-driven" approach has meant that the big Canadian-based information services company has spent the past 18 months finding out what corporate treasurers and financial managers would like in a financial data system.

IP Sharp revealed the answer last month when it launched its Analyst service, a menu-driven package that covers corporate financial data, a historical share index, Australian and international stock indices, local and overseas commodities and futures, market and economic data and currency reports.

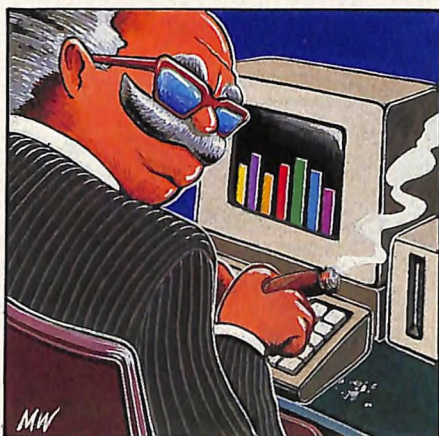
It seems that IP Sharp has thrown everything into the package, but the company spent the 18 months selecting the right package from its full list of more than 70 financial and econometric databases to offer money managers a daily reference tool for looking after their finances.

"The Analyst will give the banker, broker, researcher, economist, investment analyst and adviser what they need to turn their data into decision-making information," says Robyn McConnell, IP Sharp's database marketing manager.

The Analyst has five databases: the corporate figures include annual Statex reports, daily indices and share price reports; Australian and international commodity and futures markets give a comprehensive daily update on London, New York, Chicago, Kansas City,

By John Kavanagh

New package is the result of consumer research



Minneapolis, Winnipeg, Toronto and Montreal; financial market data includes interest rates, commercial bill rates, exchange rates, Commonwealth government and semi-government securities and a range of similar data from overseas sources; economic data covers a range of statistical and econometric data from official Australian and overseas sources; and the currency database offers daily reports from all over the world.

McConnell says the system has been designed to be flexible and will be updated as demand dictates. IP Sharp is already working on version 2 of the system, which will allow users to classify stocks on an industry basis for analysis.

The databases have plenty of historical depth — company reports give the past five years' results and information on commodities goes back to 1979.

What makes the Analyst a personal productivity tool is that, unlike other IP Sharp software packages, reports are not pre-formatted. Users can manipulate and plot the data in a variety of ways and even create their own series.

"Every prompt has two levels of help messages: one for the beginner and one to remind you what comes next," says McConnell. The menu shows users how to make complex cross-market comparisons without difficulty and as well as the ability to set up series, the user can use a detailed filtering feature for refining data for specific requirements or adding additional information.

"A user could compare the cash rate with the futures rate — you can directly compare the figures from different sources," says McConnell. "The filters allow you to do on-line searching; you can go through the corporate database and ask for stocks with particular price/earnings or net tangible assets ratios. The computer will throw up all the company names that fit into those filters."

IP Sharp has made the system hardware independent. This means that the system does not have the screen graphics capabilities of some systems, but it does provide graphics on a range of plotters.

"We could have offered on-screen charting if we had required our users to operate an IBM PC, for example," says McConnell. "But we wanted to make it available to users of almost any terminal."

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9000 students go on line

The NSW Institute of Technology has backed its commitment to high technology with a plan to introduce 9000 portable computers on a lease or purchasing arrangement. The aim is to have all of the institute's 9000 students using personal computers within six years.

Dr Fergus O'Brien, associate head of the School of Computing Science, says the institute will spend between \$250,000 and \$300,000 a year on computers. For around \$500 over six years, students will be able to lease or buy through a consortium.

The computers will be networked with the institute's Honey and Armdahl systems and will also interface with IBM PCs, a Prime 750, a DEC VAX system and Data General desktop computers.

Students will be able to work on computers from home, and download or upload files. "The idea is that people can use one of the library's 20 terminals or connect their own PC to the institute's network," O'Brien says. "Students can also link up to their school's computer and talk to it, or transfer files. This is a particular advantage, as 70 per cent of our students are part time.

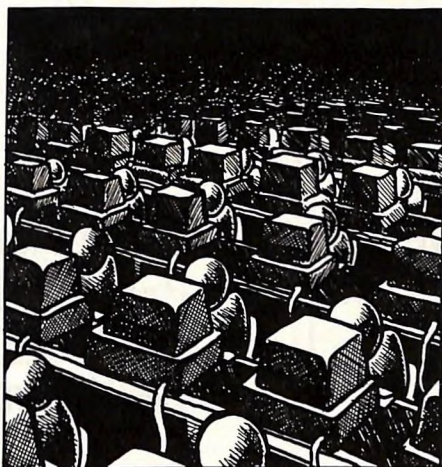
"If we have a student with a broken leg who can't get to the institute, he or she can work from home then send their assignment down to us by modem."

O'Brien says the type of computer to be used has not been selected, but the institute plans to go to tender late this year. "We will have to have a computer that can network with all our various equipment," he says. "We want something that is compatible with an IBM PC in performance, but obviously cheaper. It also has to stand up to student abuse and be light. Basically we want it to be packaged so it can be used by students and survive."

A shortage of computer technicians and a lack of women in technical areas has led the Royal Melbourne Institute of Tech-

By Helen Grant

Institute backs its commitment to high technology



nology to introduce a two-year electronic technicians course for women.

The course is designed to teach women to repair word processors, printers, microcomputers, electronic typewriters, video terminals and data communications equipment.

Kevin Alsop, head of the RMIT's School of Applied Electronics and Telecommunications, says the course is a government-financed pilot scheme to highlight equal opportunity in technical education.

The course, which started at the end of July, involves 20 school leavers and mature-age students. Alsop says school leavers attempting the course should have completed year 11 studies. Mature-age applicants will be considered on aptitude and experience or other suitable qualifications. At the end of the two years, an RMIT electronics technician certificate will be awarded to students who have successfully completed the course.

Alsop says the course is aiming to determine whether women have prob-

lems moving into engineering. "There's nothing to suggest women wouldn't do well in this area, but the course should help people get over society's aversion to women in technical areas," he says. "I believe there should be greater opportunity and encouragement for women."

Alsop says the encouragement of women technicians should boost the number of graduates in the workforce. At present only 150 out of 3000 students complete the course. "This is because it is not necessary to gain formal qualifications," he says. "Some students are being offered jobs before they complete the course. Others are working without any course training."

Alsop says graduates are now employed in areas as diverse as the police force, broadcasting, the Board of Works, private industry and self employment. He says students can expect to earn between \$15,000 and \$20,000 in the first year of employment. ■

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John Clarke: the Australian workers compensation market faces \$2.5 billion in claims

GREG BARTLEY

Fighting a \$400 million pain in the arm

Workers compensation claims for repetition strain injury over the past five years have trebled and the cost of these claims has more than doubled. It is a \$400 million headache for industry — and computers are the new villains.

Since 1980, RSI in Victoria has leapt from 3.3 per cent of the number of claims and 9.4 per cent of the cost of claims to an alarming 10.7 per cent of claims and 23.3 per cent of cost.

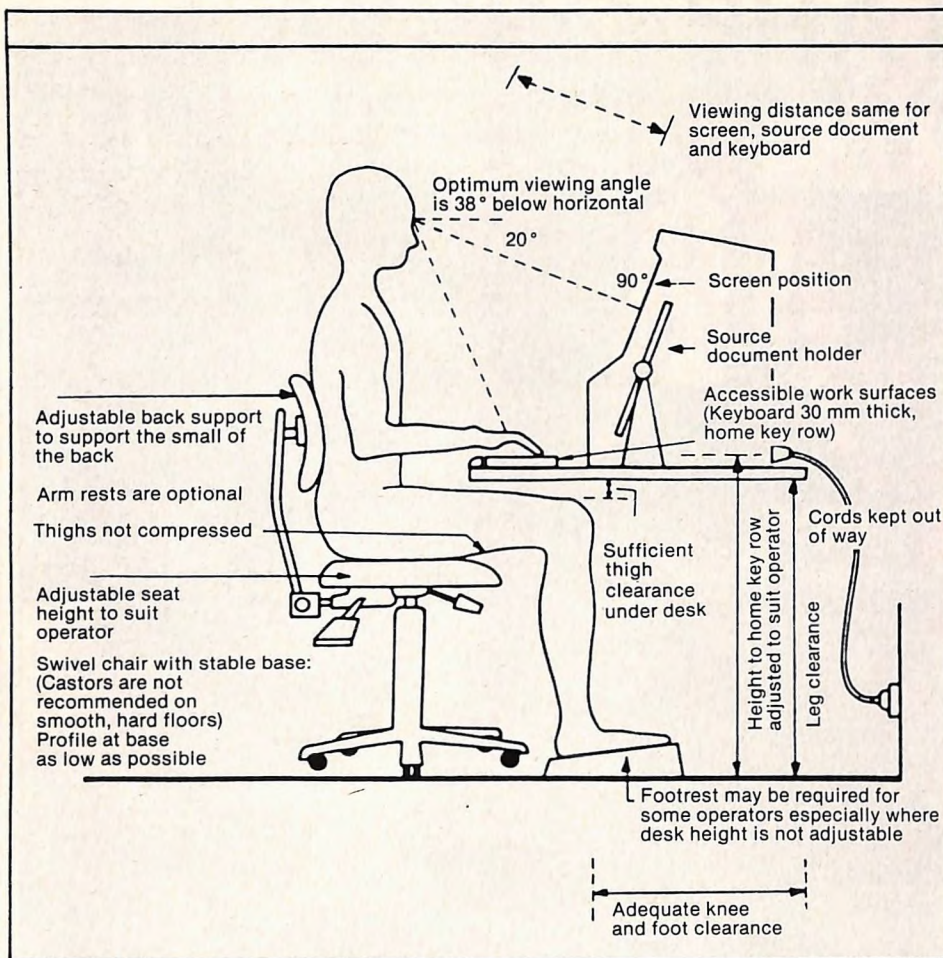
Australian business is now spending millions of dollars on ergonomic furni-

By Pamela Williams

RSI, the industrial disease of the 80s, is accounting for an increasing proportion of the annual bill for workers compensation

ture to help reduce RSI, but the bottom line is the cost of workers compensation, with premium for business of more than \$2 billion in 1984-85.

Australia's largest private workers compensation insurance underwriter is C. E. Heath, which has 25 per cent of the Victorian market. John Clarke of Heath says the Australian workers compensation market faces \$2.5 billion in claims, with RSI accounting for \$400 million of the annual cost. In Victoria, the cost to business of the total compensation pay-out is about \$800 million,



Good workstation principles as laid down by the Municipal Officers Association.

with the RSI pay-out around \$200 million.

Repetition strain injury is the umbrella term used to describe complaints and injuries related to stress and the over-use of muscles and tendons. It has become the industrial disease of the 80s and a fundamental factor in the re-design of screen-based equipment and the rethinking of the notion of work.

The cost of business is clear: of every dollar paid out in workers compensation, 20 cents goes to payments on RSI. Although RSI has become synonymous with worker injury in white-collar industries, particularly among keyboard operators, insurance figures show that it occurs in all areas of repetitious work, including chicken packing, pharmaceutical packaging, electronic component manufacturing, food production and the clothing and footwear industries.

One of the effects of RSI in recent years has been to highlight the lack of trust between management and em-

ployees. Accusations of malingering, and claims that RSI is an Australian disease or "kangaroo paw", with no overseas equivalent, have heightened the suspicions.

John Clarke argues that claims of fraud are relatively rare. "Obviously there is the suspicion that people are trying it on," he says. "But the grey area is pretty small. As a community we have got a real problem because what we are looking at is something costing the community a great deal of money. Whether it's in the arm or in the mind it doesn't really matter; we must find a way of handling it."

Changes to workers compensation in Victoria will limit common law actions against employers for the loss of future earnings. Lawyers may skirt the new legislation with common law claims against computer manufacturers for negligence or even against systems consultants who recommend systems to corporations.

Clarke says there is a strong push from Australian governments for diminished common law claims against employers and this may promote claims against the manufacturers instead. "People don't want a pension or a drip-feed compensation settlement, they want a lump sum," he says.

Clerical unions such as the Australian Public Service Association, the Federated Clerks Union and the Administrative and Clerical Officers Association have led the battle for the recognition of RSI. Pat Foster, senior federal industrial officer of the APSA, says that staff numbers and overwork are the key factors causing RSI in the public service.

She says the union wants the government to impose standard for equipment when purchasing. Union fears about the dumping of poorly designed equipment in Australia have been allayed by government adoption of the APSA criteria for equipment when tendering.

The last three New South Wales workers compensation reports have shown a rapid increase in the number of work-related injuries. In the year to June 30, 1981, the proportion reported in women workers (in new compensation cases and excluding those resulting in less than three days' incapacity) was 43.8 per cent, an increase of 25 per cent from the figure reported two years earlier.

Ergonomists and occupational health specialists say RSI has frequently been incorrectly diagnosed as arthritis or neuroses. The changing economic outlook and the growing use of electronic data entry equipment helps to explain the explosion of the present figures.

Employers, particularly in the manufacturing sector, have had difficulty in surviving the economic recession and have often responded by raising production rates, most commonly by increasing the speed of assembly lines.

The introduction of advanced technology has reduced the number of tasks carried out by employees and exposed them to greater repetition. This is particularly so with keyboard operators, where files and information for data entry are no longer stored in filing cabinets but are accessed directly through the keyboard, removing the former disruptions to keying.

Overtime, incentive payments and quotas have added to the pressure for greater productivity. On the other hand,

ERGONOMICS

bad work habits, lack of flexibility and resistance by employees to new technology have compounded the problems, particularly in the area of stress.

Alarmed by workers compensation costs, many corporations have almost tripped in the rush to implement some form of work break, such as aerobics to music twice daily, or by hiring ergonomists with little experience in diagnosing the earlier symptoms of RSI.

The president of the Ergonomics Society of Australia and New Zealand, Michael Patkin, says the first step in defining an over-use injury is to realise that it is not a single condition but a group. Patkin, a surgeon with 20 years of experience in ergonomics, says some injuries are particular or local, such as a knock, a tennis elbow or carpal tunnel syndrome. On the other hand there is also the diffuse type of injury where no pathology holds up.

"We can't identify some injuries, as with an x-ray," he says. "We need to compare this with something such as schizophrenia, where you cannot see the problem but it definitely exists. You cannot identify it as with a cut in the skin, and this leaves the door wide open for those wishing to call it a simulation."

Stressing that his views are personal and not the policy of the Ergonomics Society, Patkin says he believes that RSI is 20 per cent ergonomics, 40 per cent medical muddle, and 40 per cent mismanagement and industrial relations. He says business needs competent ergonomists to talk to them and their staff, survey the workplace and give professional advice.

"Anyone who sets themselves up as an RSI consultant and not as an ergonomist is bound to be a Johnny-come-lately and should be viewed with suspicion," he says. "They will only offer assistance in very limited areas. What is needed is a systems approach to the work being done, the physical layout and environment and the supervisory staff."

Patkin maintains that many of the problems were inevitable. "The glittering new technology compelled people to install it in a hurry," he says. "The role of the ergonomist now is to close the feedback loop between the designer and the ultimate user of the equipment — a gap created in time and space since the industrial revolution two centuries ago."

But Patkin believes the RSI problem

WORKERS COMPENSATION CLAIMS IN VICTORIA

Accident factor	Cost of claims (%)				
	1980	1981	1982	1983	1984*
Machinery	4.9	5.8	5.3	4.4	4.3
Mobile equipment	1.6	1.4	1.7	0.8	1.2
Falling/flying objects	7.7	6.2	5.2	4.2	4.1
Slipping/falling	19.8	19.2	20.0	18.3	15.2
Stepping on/striking	9.6	5.8	6.1	5.5	6.1
Harmful contact	3.0	2.0	1.8	2.0	1.9
Lifting/pushing	29.1	36.2	35.2	33.9	28.0
Repetitive strain	9.4	11.4	12.6	14.6	23.3
Hand tools	0.9	1.4	1.3	1.1	1.1
Other	11.4	7.2	5.8	8.1	6.9
Journey	2.5	3.3	3.8	3.8	4.7
Hearing loss	—	—	0.7	1.9	2.2
Motor vehicle work	—	—	0.4	1.2	0.9

*Because many claims are not finalised, these figures could change.

now presents the opportunity to catch up with decades of neglect in the forming of occupational health policy. This view is shared by the union movement.

Dr Margaret Raphael, a fellow of the Australian College of Occupational Medicine and a consultant to industry, says that a combination of engineering, ergonomics and worker-management participation can prevent RSI in most situations. She says early recognition and reporting of symptoms is vital. The chief symptoms of RSI are ache, pain or tingling in a limb, which settles overnight or after a day off, then occurs again after the next shift.

Some of the less obvious costs are in reduced morale

It seems that ergonomics is the key to resolving the chief issues of RSI. Ergonomics, the scientific study of people at work, considers such factors as equipment design, workplace layout, lighting, information handling including the learning of skills, job design and related questions of fatigue, safety and productivity.

Shell Australia's ergonomics adviser, Alan Howie, says the extent of RSI in the private sector is hard to measure because of the lack of a cohesive statistical database. But he believes the impact on business can be seen in rising absenteeism and compensation claims.

"The effects will be seen in increased costs to business," Howie says. "There is

a flow-on involved in keeping up production by increasing manning levels during absenteeism as well as compensation costs. Secondly, there is the legal problem of common law. Some of the less obvious costs are in reduced morale, particularly where there is a high level of RSI."

Howie represents the Confederation of Australian Industry on the National Occupational Health and Safety Commission's ad hoc committee on RSI. The CAI is an umbrella group for the major employer organisations, including the insurance, banking and manufacturing industries.

"The best statistics we have got are from NSW, where there has been a trebling of the compensation claims for synovitis, tenosynovitis and bursitis between 1977-78 and 1982-83," Howie says. "We can only assume that pattern for other states."

Previously unpublished material from the Australian Bureau of Statistics on Victorian accident and disease claims in 1983-84 was compiled as part of a survey from insurance company reports. The survey showed the division between injury and disease claims, with tenosynovitis, bursitis and synovitis accounting for one-third of disease claims.

Howie says there has been a lot of discussion about whether the incidence of RSI has reached a peak. "My feeling is that if we haven't, we're very close," he says. "This is because we are so aware of the problem now. There is a great deal of information about to become available for management, but even so the legacy of claims still to go through will have to be borne. Management, while being more aware, still has a great deal of reluctance to accept the validity of

ERGONOMICS

the condition, especially in the area of small business."

Ergonomists like Howie envisage a long-term systems approach to beating the problem and feel that equipment is not as important as how work is designed and organised.

Part of the strategy at Shell has been an emphasis on early reporting. The company has a highly organised occupational health policy, which stresses that the size of the problem is related to how far the injury is advanced. If it is reported early work can be re-designed fairly easily, but Howie insists that the problem must be recognised by management.

Following an array of repetition injuries incurred by Telecom employees, Telecom and the APSA have jointly sponsored a pilot program to teach people keyboard skills. It also involves management education and supervisory training programs.

Telecom has monitored RSI since 1981 and has found the greatest number of injuries amongst telephone operators,

Bad work habits

- ☐ Striking the keys too hard. This is exerting more pressure than necessary.
- ☐ Some workers can be their own worst enemy — they can be more competitive with the machine or themselves than the task requires.
- ☐ Poor work design — letting more work accumulate than you can reasonably do.
- ☐ Storing up work breaks, leaving yourself with a burst of urgent activity.

followed by clerical and keyboard workers. However, the injuries extend throughout Telecom, which tends to confirm the point the unions have been making for years: that RSI has always been with us but has been disguised as other illnesses.

The National Occupational Health and Safety Commission's ad hoc committee on RSI, which had representatives from private employers, the ACTU, the Federal Government and all state governments, recently delivered a report that emphasised that there was a need to

dispel the prevailing myths about RSI to clear the way for positive prevention measures.

Jim Brassil, chairman of the NOHSC, argues that RSI has been around for years in other countries, but has masqueraded under a variety of other names. "In America it's not referred to as RSI," he says. "What we call RSI is called office trauma over there. In recent reporting of tenosynovitis in the US not one case was reported in the office environment.

"On investigation it turned out that this was due to the fact that they call it office trauma and it appears under different statistics. In Japan it is called occupational cervico-brachial disorder and in Europe it's known as musculo-skeletal disorder."

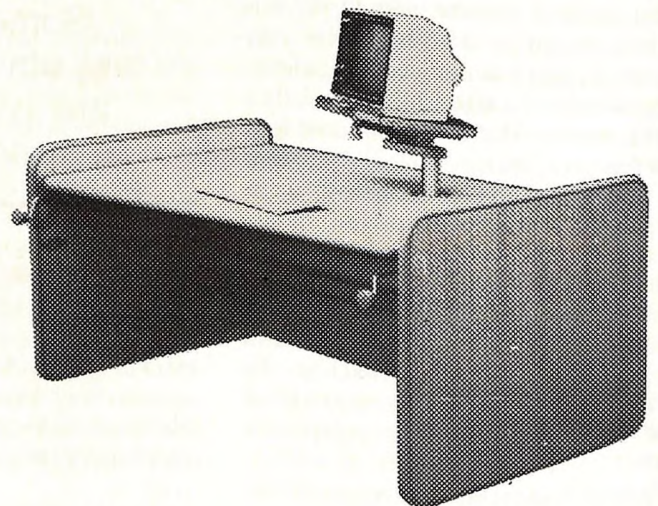
The report's summary said there was a need for a far-reaching education program to enable the community to recognise and respond to RSI, as it has with back and sporting injuries. It stated categorically that with the large body of knowledge in the field of ergonomics

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- ☐ Take your work breaks within the hour and stretch during them — don't just sit around.
- ☐ Use relaxed, symmetrical keying techniques.
- ☐ Use document holders to position information in the most comfortable way.
- ☐ Be aware of early symptoms of RSI — no one else can help you if you don't know what's wrong.
- ☐ Report any symptoms — this is crucial if preventative action is to be taken or your work redesigned.

RSI was preventable.

The medical profession has been criticised for not recognising RSI in the past. The committee recommended that a form of checklist for GPs should be circulated to help them recognise RSI. It also recommended that all health professionals be trained to improve the management of people with RSI. Acknowledging the lack of statistics on RSI, the committee recommended the establishment of data collection systems to monitor the prevalence of RSI.

The medical director of the Vocational Rehabilitation Service in Victoria, Bill Stone, says RSI and hearing loss are the two rapidly growing areas of workers compensation.

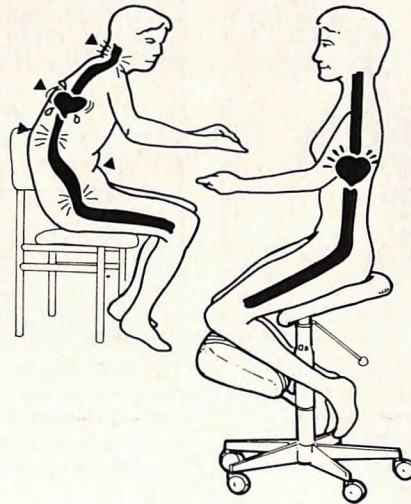
"Workers compensation is the most rapidly increasing component of on-costs to industry," he says. "Together with annual leave and payroll tax, it comprises over 50 per cent of all on-costs. The total on-costs add between 30 and 80 per cent to wages. In recent years workers compensation costs have risen much faster than wages."

The prevention, early treatment and rehabilitation of repetition strain injuries can have a profound impact on company costs. For many employers workers compensation is now the second largest item of expenditure after wages.

Stone says the added or unseen costs of RSI can be almost as great as the compensation pay-out. These are the costs of make-up pay, lost production of the affected worker, lost time in training replacement staff, and administrative staff time in handling a claim. Less direct costs include the inefficiency of affected workers still on the job, low morale of other workers (especially if they have to share the absent staff

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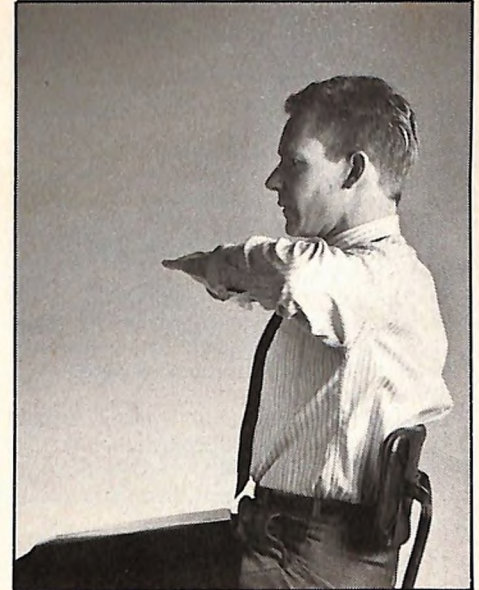
ERGONOMICS



Here are some simple exercises, from a series devised by Dr Margaret Raphael, to help prevent RSI. First, sit up straight. Stretch the arms behind, elbows straight. Now draw the shoulder blades together. Relax and repeat five times.



Turn the head as far as it will go to the right, then to the left, keeping the shoulders relaxed and still. This exercise should be done first with the chin tucked down, then chin raised, each five times.



Raise the elbows to shoulder level, hands in front, middle fingers tip to tip, spine erect. Bring the elbows back as if to meet (keeping level) and take a deep breath. Do not raise the shoulders. Repeat five times.

member's work load), and possibly industrial problems.

NSW occupational physiotherapist David Tasker, who consults to industry on occupational health and ergonomics, specialises in the prevention of musculoskeletal injuries and the general rehabilitation of employees with RSI. As a consultant to John Fairfax & Sons Ltd, Tasker advises on education for both management and employees. He maintains that if it is impossible to laterally expand the work or alter its repetitious nature, an exercise program should be introduced.

"Theories from Scandinavia, Japan and Australia bear out the idea that pause gymnastics assist in avoiding RSI," Tasker says. "These are exercises designed to correct the effects of the task. Other things to be looked at are the psychological effects of the task, particularly stress. Once you have looked at the job design and stress management you can think about the equipment."

Tasker says that after the initial capital expenditure it can be relatively easy to make the changes that will reduce future compensation claims. "I think the bottom line is that repetition strain injuries can be prevented, people can be treated and they can be returned to work," he says.

Choosing the right equipment

By Helen Grant

Your company may be spending big dollars on office furniture, but the wrong choice of equipment can contribute to RSI problems. To avoid these problems, employers should look at the user, the task, the

tool and the environment. First ask your staff to fill out questionnaires indicating time spent on the telephone, typing (word processing or typewriter), retrieval and filing.

Managers should fit the task to the person, rather than fitting the person to the task. To do this, management must analyse job design, mental and emo-

Some things to do to avoid RSI

- ☐ Consult a qualified ergonomist or occupational physiotherapist to look at the design of the equipment, the work, workplace layout, and questions of fatigue, safety and productivity in your office.
- ☐ Consult your staff about new office equipment.
- ☐ Buy recommended equipment after a serious look at the requirements of all concerned.
- ☐ Make sure your staff levels are high enough to cope with the workload. Money saved on staff can be lost on higher premiums due to injury rates.
- ☐ Plan ahead for seasonal overload, and get in extra staff if possible instead of relying on heavy overtime.
- ☐ Be aware of morale problems in your

office. An organisation with high morale can withstand a faster rate of change and more temporary problems without damage.

- ☐ Introduce job rotation and job enlargement or multi-skilling where possible. Don't replace one type of keying activity with another during job rotation.
- ☐ Provide resources for the education and training of your management, supervisors and staff in the prevention of RSI.
- ☐ Ensure that your employees have been shown how to make the necessary adjustments to any workstations you install.
- ☐ Be sure you have adequate work breaks to avoid an accumulation of fatigue and strain.



GREG BARTLEY

Of mice and windows

Do you need some help banishing those difficult-to-use-computer blues? Like a headache remedy that promises relief using a combination of ingredients, a lot of new software these days features an amalgam of mice, icons, windows, and integrated functions.

Together, the mouse hardware, the

By Steve Rosenthal

Mice, icons and windows represent a great step forward

icon-and-window presentation style, and the integrated operating instructions are designed to make it easier and faster to get work done on your computer.

Each of these approaches to making software more accessible may be valuable in its own right, but just as with medicines, various firms combine them in different ways to produce what they

hope is a more saleable package.

Of all these innovations, the mouse is probably the most symbolic of the change in outlook. Using this palm-sized device as an adjunct to a keyboard changes computer operation from linear, text-oriented and abstract to geometric, graphic and concrete.

In the past few years, psychologists have been confirming what artists have been saying for years — the eyes and the body perceive information about shape and movement that can't be precisely translated into words. Until recently, computer use has relied on linear, word-oriented skills. Mice are among the

elements that point toward a more balanced approach.

Because mice and a graphic mode of interaction appeal to different parts of the brain than do keyboards and words, they open up computer use to many people who find dependence on the keyboard an insurmountable psychological barrier. The difference is enough to enable some users to perceive a system that uses a mouse as "user-friendly", while they see an otherwise identical system that relies only on the keyboard as remote and unapproachable.

At the operational level, mice are

actually specialised cursor controllers. With the right hardware and software, the movements you make with a mouse are reflected directly on the screen.

Any software application that involves cursor keys or positioning commands can potentially use a mouse. Mice are particularly good for selecting from menus, pointing out locations, drawing figures, and for positioning elements of a picture.

When the main activity is choosing among various options, you can use mouse input instead of relying only on the keyboard. If the program requires a mixture of selection and specification,

What the words mean

By Steve Rosenthal

This glossary covers many of the words and terms used in relation to mice and windows.

Active window

In a display that divides the screen into regions for separate tasks, the region currently responding to your inputs or showing outputs. Most software for the Apple II family and the Macintosh can have only one active window at a time.

Button

In Apple usage, the term refers to both the push-switch built into the top of the mouse and to certain on-screen symbols. The symbols are the oval and octagonal shapes that contain single choices for you to select with the mouse pointer to indicate what you want done next.

Click

To press and release the button on the mouse. To click on a selection, you position the mouse-controlled pointer on the item and then push the mouse's button.

Clipboard

The term Apple uses for a buffer (temporary memory-storage area) where you can save sections of your work that you can later transfer within files or between documents. The clipboard holds only one item at a time, but when you use the Macintosh you can transfer extra items from the clipboard to the scrapbook.

Copy

To take a selected portion of a screen or document, leaving it intact, and to put a

duplicate of that portion on the clipboard. From the clipboard, you can paste it into other documents or into a new place in the same document.

Cut

To take a selected portion of a screen or document, remove it from its current location, and put it on the clipboard. From the clipboard, you can paste it into other documents or into a new place in the same document. If you don't paste the material from the clipboard before cutting or copying something else, the copy on the clipboard is deleted.

Desk-top

This is the metaphor (way of presenting the system) of the Macintosh, the Lisa, and several integrated programs for the II family. In this method, you store files on disk, make them available for use by bringing them out on to the desk-top, process them, and then store them away again. The idea is to achieve an understandable process by modelling the software on the way people work with papers on their desk. With most desk-top software you can pile several items on the desk-top, but most programs let you work only on the top item in the stack.

Double-click

To allow the single button on the Apple mouse to indicate more than one type of operation, most software interprets two clicks in rapid succession (a double-click) as a different command than two separate clicks. You can specify the timing difference between a double-

click and two single clicks by using the Macintosh control panel or the Lisa's preferences.

Icon

A pictorial symbol that represents an operation, file, program, peripheral device (such as a printer), or disk. Icons are also known as "conceptual objects". Because most people find pictures easier to recognise than words, icons let you choose quickly from a group of choices. Most new software from Apple uses at least a few icons to show what choices are available at various times.

Mechanical mouse

A mouse that depends solely on moving internal parts to relay signals about where you are positioning the device. The advantage of this type of device is that you can use it on most surfaces, so you don't need a special pad or plate. Like any mechanism, however, mechanical mice can eventually wear out.

Mouse

A palm-size device that you move around on your desk or on a special flat plate to move a corresponding cursor or pointer on your computer screen. Translating the displacement of mice to the movement of the pointer can involve various methods. Apple and many other firms believe that using a mouse for computer input is a method superior to the alternatives, but this belief is still controversial.

Optical mouse

A mouse that senses its movement by reading light patterns reflected from a light-emitting diode or lamp into a

though (such as choosing an operation and then specifying a filename), you have to use both the mouse and the keyboard.

Adding a mouse doesn't in itself guarantee a good "user interface". From the software designer's view, planning for mouse input involves more than just changing the keyboard input routines. One way to think about the difference is to say that mouse input is wide rather than deep.

With a mouse, you can quickly select any character on the screen, any region, any line, and so on. In contrast to using a keyboard, you can't ask for options

photocell. Most current models must be used on glass or metal plates printed with special grid patterns, but some newer models are designed to use reflections from ordinary paper or cloth.

Optomechanical mouse

A mouse such as the Apple mouse that combines both mechanical and optical devices.

Point

When applied to mouse use, to move the mouse so the cursor indicates a particular choice or object. For example, to point to a word in MacWrite, you move the mouse so the on-screen indicator moves to the spot you want to work on.

Pop-up menu

A set of choices that is presented only when you select its title or icon. On the Macintosh they are often called "pull-down" menus because they come down from the top line of the screen.

Pull-down menu

A "pop-up" menu (one that shows all the choices only when you select its title) that comes down from the top line of the screen. Most software for the Macintosh uses pull-down menus.

Tile

A style of showing more than one task on a single computer screen. With tiled windows, when you add a task the existing ones shrink and move aside, leaving room for the new task to be displayed along with existing ones. In contrast to overlaid windows, no window overlaps any other, and the various windows fit together on the screen like pieces of tile on a wall. ■

Many types of hardware can, at least in theory, work with a mouse

that weren't displayed, however, and creating complex replies is difficult. Mouse-oriented software must therefore take users through smaller steps and branches to provide as many possibilities as the keyboard does, and it must be more thorough in informing users what their choices are at each stage.

Some users find this approach annoying. If you like to combine steps and give instructions in advance, you may have trouble keeping this working style and using a mouse. In fact, a mouse may slow you down — it really depends on which way you think, how quick your fingers are compared with your wrists, and a host of similar individual factors.

If you think best in steps, like to see your options, and are good at eye-hand co-ordination, you may find your work goes more quickly if you use a mouse. A good deal of research has been done on this question, but none of it is sufficiently clear to predict individual reactions.

Many types of hardware can, at least in theory, work with a mouse. You get the best results with systems that allow the central processor to write directly to the display screen (memory-mapped display). All of Apple's computers use this method, as does the IBM PC.

With a memory-mapped display, the software and hardware can treat the mouse movements as directly analogous to moving from pixel to pixel (the small dots that make up the display image). Thus, you can use the mouse to mark objects smaller than a single on-screen character.

In theory, a mouse can send out positioning signals representing even microscopic changes in position. Because the utility of the mouse depends on the feedback between what you see on the screen and the way you move your hand, however, mouse inputs are generally limited in practice to the precision of the video screen. High-density displays, such as those on the Macintosh, allow mouse inputs precise

enough for drawing and editing as well as choosing from menus.

Computers that don't use memory-mapped screens can still use mice, but the precision and smoothness of mouse movements is more limited. Most CP/M or "vanilla" MS DOS computers let the house software move only between character positions, limiting the possibilities to the normal rectangular display field, which is 80 characters wide by 24 rows

Whether a mouse is a significant advance for interacting with personal computers is a matter of hot dispute at many computer companies, but at Apple, the mouse partisans have won out. The Lisa computer was Apple's first mouse-oriented computer, and the Macintosh obviously follows in that line.

The new Apple IIc is also mouse-oriented, although the effort to keep it compatible with existing Apple II-family software kept Apple from making the mouse the main input device. And to keep the IIc compatible with new IIc mouse-oriented software, Apple is now selling an optional mouse board and mouse for the older machine.

According to both marketing and engineering people at Apple, the mouse is an essential part of all major new software and hardware projects at the company. Part of the impetus for that commitment is fervent belief in the mouse — and part comes from the realisation that the mouse is something that Apple has and IBM does not.

Of course, the mouse is not the only alternative input device. If you have an Apple II or III, you can also choose among joysticks, graphics tablets, trackballs, light pens and touch screens.

Most of these keyboard alternatives can theoretically do the same job as the mouse. The exception is the touch screen. Although it is in some ways more convenient than the mouse (you don't need extra room on your desk-top, you don't have to look for anything when you have been using the keyboard, and you don't have as many cables to tangle), a touch screen doesn't have the resolution the mouse gives you. Most touch-screen software resolves only a few dozen points across the screen — far fewer than the 80 characters or several hundred pixels you get with the mouse.

Right now, most computer companies seem to agree with Apple that the



mouse is the best choice for productivity (non-game) applications. That preference could change when lap-size computers become more prevalent. Mice need a smooth flat surface, and besides, most people would rather not have a mouse running around in their lap.

In popular imagination, biological mice are paired with cheese. In the personal computer world, electronic mice are often paired with icons.

An icon is a stylised picture that serves as a symbol. Instead of using a word or phrase to represent a concept or object, a computer can use an icon as a graphic equivalent. Most are pictorial, but they can also be abstract, evocative (intended to create certain associations or connections in the viewers' mind), or schematic (representing the way something works, rather than what it looks like).

Icons, say their proponents, are "friendlier", easy to distinguish quickly,

and a welcome change from the usual endless text on the screen. Because icons are graphic, you react to them differently than you do to linear, word-oriented labels. Icons appeal to the artistic side of the brain. You can react to them without translating them into words.

In practice, icons in any but the simplest of programs are supplemented with text labels or explanations. That's because most people in our culture, unfortunately, can distinguish only icons that are markedly different. To communicate all of the various options and parameters in a program of any complexity, software authors still need to resort to text. In other areas of the world that use pictographic alphabets, a totally iconic approach might be more successful than it is here.

The lack of subtlety in our visual vocabulary has another unfortunate effect. Because most icons show only gross differences, using icons implies a

level of simplicity that users may unconsciously read as lack of sophistication. An iconic presentation that even a young child can understand may come across to experienced viewers as simplistic and boring.

The challenge, then, for using icons in software is to make them understandable to new users but informative enough for the more experienced.

Apple's approach to icons has been a balanced one. Although icons represent files and disks on the Macintosh and Lisa, each icon also has a label underneath. If you want a detailed view of the directory, you can switch the directory listing from icons to text listings.

Apple's mouse-oriented graphics programs (MacDraw, LisaDraw, MousePaint) also use icons for many of the options, but even in them the pull-down menus for more complex operations show you a series of phrases rather than a series of pictures.



In more text-oriented programs (such as MacWrite or LisaWrite), icons take a backseat to words but are definitely part of the package. In MacWrite, for example, you place a date in the page header by dragging a calendar icon to the position in the header where you want the date to appear. In AppleWorks, the files appear in a series of outlines that represent file folders.

Icons also play a key role in scrolling on the Lisa and Macintosh. You tell most software for these machines to display a different portion of your text by moving a scroll bar or elevator — both schematic symbols for the scrolling process.

If you don't associate icons with electronic mice, you probably think of windows instead. Dividing the screen into different boxes doesn't necessarily have much to do with electronic rodents, but these two approaches have more than a random connection.

Both of them emphasise the position of information; for best results, both need fast, detailed graphics screens; and both widen the channel of information between user and machine.

Not every display with a box shape on it has windows. In theory, each box on a windowed screen is independent, and each one involves a separate program or activity. Windows are often associated with multi-tasking software (which allows you to work on several jobs or steps in the same computing session), especially multi-tasking software for single users.

Software that is not multi-tasking may still have windows, but because the processor handles only one task at a time, only one window on each display can be active at any time — the other parts of the display are frozen. If the software can update each window fast enough, in turn, the result may be apparent activity in all windows.

Along with offering many advantages for presenting complex information, windows simplify the writing of mouse software. With windowing, software designers do not have to limit the display of the program to one end of the screen and the menus and icons for the mouse to another. Instead, they can write software to open windows in front of other tasks when they need to show a complex menu and can hide the menu when they don't want it any more.

Pop-up and pull-down menus are

another form of windows. Instead of taking a central spot on the screen, these lists of choices usually occupy an area extending from the screen's edge in towards the centre. Because it takes up screen space only when it is in use, this type of menu lets the software offer you a wide range of choices without taking up valuable space from the main display.

Since Apple started marketing the Lisa, almost all company-produced soft-

A new style of software seems to be emerging

ware has relied extensively on windows. Along with icons, windows are the most visible manifestation of the direction Apple has been taking in software design. The Macintosh makes extensive use of windows, and programs such as AppleWorks for the II family let you open one task on top of another.

Another system approach that many people associate with mice and windows is integrated software. Integration is the attempt to make several tasks appear to work in similar ways and to let various applications share data.

As a company, Apple has been promoting integrated software packages for several years, first on the Lisa, then on the III and the Macintosh, and now on the II family. The Lisa, in fact, originally came with a bundled-in group of six integrated applications whose design presented a similar user interface. Although data interchange among the packages was not perfect (you couldn't move data, for example, from the word processor to the spreadsheet), it was far better than software for alternative machines.

Macintosh software is taking a similar approach. Apple has gone even further and heavily promoted a Macintosh software toolkit among independent developers. If developers use Apple's routines and follow the guidelines, the result will be a whole swag of independent programs that share a similar user interface and can exchange data.

Integrated software for the II family, strangely enough, has been quite rare until recently. The popular VisiCalc,

VisiPlot, VisiTrend, the VisiFile series and the PFS series of Write, File, Report and Chart have been the only major popular packages in this market for several years. That situation is changing, though.

The new entries are Jane, a heavily promoted package from a start-up company called Arktronics, and AppleWorks, from Apple. Both packages feature simple word processing, databases, and spreadsheets. Jane is aimed at less experienced users and runs on the IIe and IIc (versions of Jane are slated for several other computers as well). Thus far, only Jane supports a mouse.

Jane is an example of an almost complete reliance on graphics and geometry as a command language. Virtually all the menus, including major submenus, involve icons. If you want to type, you choose a pictograph of a typewriter. To cut, choose the scissors. To copy, use the camera.

AppleWorks, on the other hand, is a product that is only beginning to see the world in graphic terms. The original release doesn't use a mouse (but a future version is likely to do so). It does use windows, for normal program displays as well as error messages.

Both of these programs attempt to offer a high degree of integration for commands and a lesser degree for data. In Jane, you choose from a general set of tools for all applications, plus a specialised set for each one. In AppleWorks, several combinations of Apple keys plus letters operate in similar fashion across all applications.

Data flow in these programs is principally a one-way affair. Both will let you take information from the spreadsheet or database and paste it into your word processor document. In Jane, you cut with the scissors or copy with the camera and then paste with a paste pot. In AppleWorks, you use similar operations to copy to a clipboard file and back. AppleWorks also lets you read in a file stored in the DIF file format set up by VisiCalc or in the Quick File format.

For most of its short history, the computer industry has concentrated on words and numbers. Now that millions of systems with graphics are out in the field, a new style of software seems to be emerging. These new combinations of mice, icons, windows and integration may represent a great step forward, but they are still no panacea. ■



The programmer's view

By Thom Hogan

Each article I write about the Mac seems to get the same response: "When are you going to tell us how to program the Mac?" I wish it were so easy.

You see, the Macintosh "user interface" has its advantages and disadvantages. On the plus side, the intense use of graphics makes it easy for program *users* to understand the Mac. To paraphrase an old adage: "An icon is worth a thousand filenames." In addition, each item has its place on the Mac screen, so users know what to expect. The mouse makes moving and selecting items much more intuitive than operating systems you operate with command lines. And the "what you see is what you get" approach of most Mac software is an improvement for those of us who have always led paper-oriented lives.

The drawbacks of the Mac interface primarily affect programmers. Although you have 64K of prewritten ROM code, understanding how these routines interrelate takes a lot of study. Also, the user interface takes a large chunk of the 128K Mac's RAM: 21K for the display and 16K for tables and the system heap, or even more, depending upon which resources you are using.

The natural inclination of many computer programmers is to turn to high-level languages to simplify their chores. The first high-level language for the Macintosh was Microsoft Basic version 1.0.

Microsoft Basic version 1.0 was a disappointment to me. First, for all the computing power inside the Mac, it was slow. Second, I kept finding small bugs that got in the way of my programs.

Our first task in learning to make Mac magic is to be familiar with the various components of the operating system, what each does, and how they interrelate. Unfortunately for long-time computer users, almost all of the terminology will be new.

You recognise some of the terms from reading the Macintosh manuals: *pull-down menus*, *menu bars*, *windows*, *icons*, and so on. I will assume that you are familiar with these and proceed with a rundown of the terms Apple didn't describe in the Mac manual.

First we have the Finder, which most of us would call the operating system. It

The Macintosh user interface has its good points and bad points

is the mastermind that controls loading and execution of programs and the desk accessories and makes calls to other, lower-level "tools" (routines).

Within the Finder, we find several "managers", each of which controls one aspect of the Macintosh user interface. At the highest level is the Dialogue

The Mac's Font Manager actually draws text on the screen

Manager, which, appropriately enough, handles the dialogue boxes that pop up at various times, such as when you insert an unformatted disk.

A dialogue box has several parts (a window, some text, possibly icons, click-on boxes, and so on), thus it makes calls to other even lower-level managers within the Macintosh's software.

For example, we have TextEdit and CoreEdit, two routines that handle text input and editing. TextEdit resides in ROM and performs the basic text-editing chores you might expect from a word processor: deleting, inserting, working with blocks of text, and so on. CoreEdit is in RAM and adds more advanced features to TextEdit. These two text-handling routines are one reason that almost all data-entry routines on the Macintosh feature the same abilities that resemble those of a word processor.

Below TextEdit and CoreEdit in priority come several other managers. The Control Manager and the Menu Manager have the highest-level priority of these managers. The Control Manager controls controls, if you will — that

sounds more confusing than it is. In Mac terminology, buttons, tick boxes, and scroll bars are all called "controls", and the Control Manager runs them.

The Menu Manager is responsible for those pull-down menus you see on the Mac's top line. Besides handling the naming chores for each menu item, the Menu Manager also detects tick marks for selected options and takes the appropriate actions (as in the font menus of MacPaint), highlights the chosen item, and sets up equivalent command-key sequences, if you need them.

Many of the functional areas we already talked about invoke the next of our managers, the Window Manager, which creates and manipulates the Mac's windowing scheme. (By the way, the Mac's windows need not be rectangular, although that shape is the easiest to work with.)

The Window Manager also moves windows from place to place when you "drag" the window with the mouse. Fortunately, the Window Manager can handle multiple windows, redrawing them as necessary when you move them around or selecting a different one to be the topmost on the desk-top.

As we get to the lowest levels of the operating-system hierarchy, we begin to discover the routines that do the real grunt work for programmers. The Toolbox Utilities contain some miscellaneous routines that we can't really classify into one of the other managers.

The Event Manager concerns itself with the keyboard and the mouse. The following actions qualify as "events" in the Mac's world: pressing a key, releasing a key, moving the mouse, pressing the mouse button, and inserting a disk. The Event Manager records the time any of these events occurs (in 1/60 second increments). It also reports the mouse's position and the status of several important keys (Shift, Caps Lock, and so on). The Mac's ROM routines are particularly suited to programs such as typing tutorials, since they give the programs a wealth of information to work from. The Event Manager is misnamed — Event Reporter would have been a more accurate designation.

I have already briefly mentioned the QuickDraw routines, which almost



everything you see on the Mac's display has gone through. The Mac's speed in updating the display is inherently linked to the brevity of these machine-language routines. You don't have to analyse Bill Atkinson's work carefully to appreciate it; the results are there on the screen. Lest you think that the Macintosh's software design is fixed in monochrome, you should know that QuickDraw has routines for manipulating color graphics. I don't mean to imply that the Mac will eventually have color, but its user interface does have a life after black and white.

Next we look at the Font Manager, which handles the way text appears on the Macintosh screen. Unlike other computers, however, the Mac makes no distinction between text and graphics "modes" of display. The Mac's Font Manager actually draws text on the screen. This ability promises some potential for Mac that even Apple has apparently yet to pursue. Since fonts are nothing more than patterns, the implications for complex character-oriented animation on the Macintosh are striking. Remember, you can make fonts bold, decrease or increase their size, and change them to outline style.

The last of our Macintosh managers is the Resource Manager. Others have written that the Resource Manager is like a librarian, and I believe that this is an apt analogy. The Mac's library is in immaculate shape — menus, icons, fonts, dialogue boxes, and even program code are all stored on disk as a resource.

The Resource Manager's job is to make sure that the correct resources are available when required and to shuffle everything between disk and memory as needed. One aspect of the Mac's programming that relies upon the Resource Manager is the foreign-language versions of the software. Apple has designed its programs so that all messages appear in resource files that are separate from actual program code, meaning that to create a new version of the program for another language, you have only to change the message file.

Conspicuously missing from the managerial staff of the Macintosh is a Sound Manager to use the Mac's built-in sound system. After hearing the Mac talk, I am surprised that Apple chose not to add sound to the operating system. Perhaps this capability required too much memory, perhaps we will see

some additional managers later, or perhaps Apple is saving Mac's speaking abilities for the machine's more "mature" years.

OK, now that you have met the players, let us see if we can put together a simple sample of how to use the roster. For now, we will content ourselves with pretending to program the Mac in assembly language. As I write this column, I need at least a Lisa 2/5 with one megabyte of memory to do my

You never access the ROM routines directly

software-development work. Therefore, this month I will "talk" you through some assembly-language code. Maybe later I will have a copy of the Mac assembler and be able to start showing you how to program the Mac directly.

First and foremost, you need to know that you never access the ROM routines directly. Instead you use what Apple refers to as the "Trap Mechanism".

When Motorola designed the 68000 chip, it left the op codes beginning with the bit pattern 1010 (0A hex) out of the instruction set. When the processor encounters an instruction that begins with 1010, it recognises that as an "unimplemented instruction" and proceeds to examine the remaining 12 bits of the op code word to determine what unimplemented instruction is desired. The processor uses a routine in low memory called the Trap Dispatcher to determine this information and, based on what it finds, it executes instructions at another memory location.

Apple's way of using this "trap" instruction gives programmers access to all the ROM routines via pseudo-op codes. The least significant seven or eight bits of the op code indicate which ROM routine you are requesting. You have to make sure that appropriate values (for parameters to be passed to the ROM routines) are already on the stack.

Apple designed the ROM routines as macros (each begins with an underscore to indicate that it is a trap macro), using the names of the ROM routines. For

example, you use the PenSize routine used in Microsoft Basic this way in assembly language:

```
MOVE.W #1,—(SP) ;push width of 1
MOVE.W #2,—(SP) ;push height of 2
—PENSize       ;execute PenSize
                  routine
```

The first two instructions move two 16-bit integer values to the stack for use by the PenSize routine. Apple's strong orientation toward Pascal shows in Macintosh assembly-language programming requirements. Lisa Pascal pushes procedure parameters on to the stack in the order they are encountered in a statement. For example, FillRect (myRect,1, the-Port^.pnSize.v,white); is the Lisa Pascal equivalent to the following assembly language:

```
PEA      MYRECT
MOVE.W   #1,—(SP)
MOVE.L   GRAFGLOB(A5),AO
MOVE.L   THEPORT(AO),A1
MOVE.W   PNSIZE+V(A1),—(SP)
PEA      WHITE(AO)
—FILLRECT
```

If you are not sure what all this means, you can feel better knowing that few people do. The left column contains assembly-language mnemonics for 68000 op codes (including Apple's —FILLRECT pseudo-op code). The right column consists of arguments (called "operands" in assembly-language parlance) for the corresponding op code. MYRECT, GRAFGLOB, THEPORT, PNSIZE, and WHITE are all names for predefined values. Actually, this assembly-language fragment is similar to our last one. It sets up the stack with some values for —FILLRECT and places other values in some of the predefined variable locations in the Macintosh.

I strongly suggest that you get acquainted with both Pascal and 68000 machine language. Pascal books abound; one that I really like that is a bit difficult to find these days is *Programming for Poets: A Gentle Introduction Using Pascal* by Richard Conway, James Archer and Ralph Conway, published by Winthrop Publishers.

On the assembly-language side, two helpful books are *68000 Assembly Language Programming* by Gerry Kane, Doug Hawkins, and Lance Leventhal, published by Osborne/McGraw-Hill, and *Programming the M68000*, by Tim King and Brian Knight, published by Micro Computer Books (Addison-Wesley). ■



AppleWorks revisited

By Neil Munro

Reviewers have been somewhat back-handed in their praise of developer Rupert Lissner's creation, AppleWorks. The first review in *Today's Computers* (February 1985) also damned it with faint praise. But with a few months' experience, it is important that we look at this software phenomenon again.

The fact is that reviewers often tend to fall into the trap of regarding bigger as better. They become pre-occupied with megabyte memory-banks and 16 vs 32-bit data-bases and they overlook the fact that thousands of businessmen and women already use Apple 8-bit micros in their everyday work.

Some reviews of AppleWorks have been good, but generally it has been word-of-mouth and direct sales promotion that has boosted the program to the top of the best-selling charts. In Australia it is now selling a thousand copies a month. At around \$300 for a three-module pack of programs (database, word processor and spreadsheet) even students and home users have

The marketplace has decided that AppleWorks is a serious set of software tools for business

been raiding their piggy banks to get their hands on the program, because AppleWorks is not just a tool for business.

The "best for less" price promotion of the package made some reviewers suspicious from the start, but it's not difficult to guess why Apple took this line. It is in the business of selling hardware, and AppleWorks' popularity meant more sales of the Apple IIe, and more upgrades from the 64K to 128K machines. Remembering what Visicalc did for the old Apple IIs this was a

surefire marketing strategy. But for this ploy to work, the product had to be great — and AppleWorks is great. And this time Apple holds the copyright and gets all the profits on the software.

The real power of AppleWorks only becomes apparent after you have used the program over a period. It pushes the concept of user-friendliness into the realm of "user-gentleness". It is menu-driven all the way, and is paternalistic to the extent that it prevents you from making silly and disastrous mistakes through inexperience or inattention. But behind this polite and gentle exterior lies true computing muscle and some very practical and innovative operating techniques.

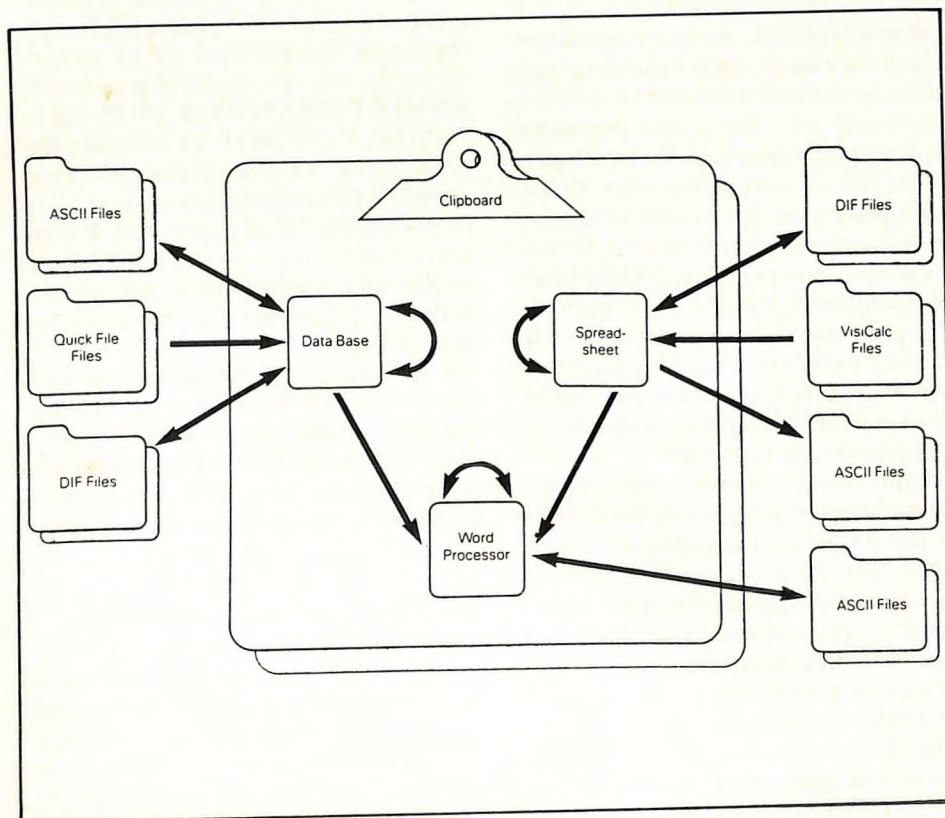
AppleWorks conforms to the dictionary definition of an integrated package. The three program modules are not automatically linked, but neither are many others sold under the "integrated" label. Data can, however, be transported from one module to another very easily via a clipboard.

The ability to cut and paste between alien formats (spreadsheets to database; database to word processor) is extremely low on the list of priorities of businessmen using the Apple II, but, like Ayers Rock, it's nice to know that it's there. On the other hand, cutting and pasting within text files, or from one text file to another, is often required, and with AppleWorks it couldn't be easier; the program has got its priorities right.


Each of the modules in this suite of programs has its own integrity and each is valid in its own right. The word processor is a true word processor, the spreadsheet is a real spreadsheet and the database is a real database. This is something that can't be said for any of the biggest and "best" integrated packages available for 16-bit PCs.

AppleWorks grows on you; the more you get to know it the more you find to like. There are little things, like the fact that the word processor will search for text-strings either as upper/lower "case sensitive" or not. Either can be selected. This is just one more minor hassle resolved by careful program construction.

Not many databases (if any) allow you to sort chronologically on a time



The AppleWorks clipboard arrangement



field that has been automatically standardised, whether the user enters say, 8, 8a, 8am or 0800. However it was entered into AppleWorks it will appear as 8:00 AM in the listing and be sorted accurately on that basis. AppleWorks doesn't prevent you from entering the data incorrectly — it makes the correction for you. Now that's user-gentle.

Date fields are handled in much the same way. You can enter a date: 8 July, 1985; jul8 85; July 8 85; or 7 8 85 (but naturally not the Australian way 8 7 85), and in all cases the program will instantly convert it to the international format Jul 8 85.

Another innovation in the spreadsheet mode is that AppleWorks allows you to type pages or paragraphs of notes across cell boundaries without having to move the block cursor. In the automatic-type mode, a push of the down-arrow key takes the cursor back to the left margin set by the first text keystrokes. Again the innovation is very practical and speeds up entry.

These innovations are important, but of minor consideration compared with the way AppleWorks frees up your working habits with a computer. Its greatest advantages are in the way it allows you to have 12 different files (of different types) sitting in the computer's RAM memory at the same time, ready for action.

As I type this document into an AppleWorks word processor file, I know that with a couple of keystrokes I can be looking at my (database) address file, waiting in another part of the Apple's memory. Another couple of keystrokes will take me to my personalised business spreadsheet layout where I keep account of my expenses and income. I have notes for another story on a different word-processing file, and occasionally I zip across and enter another bit of information as ideas come to me. None of this file swapping requires me to leave the AppleWorks program or to swap disks (with two disk drives).

I am sure that the key to the success of the program is that it allows people to work the way they think — mainly on one thing at a time, but with frequent side trips to other business. The program also has its ears and eyes open to the rest of the world.

Via Apple's Access II communications program, AppleWorks files can be transmitted without modification to

other AppleWorks users. It has its own format for storing files, but it's not a locked-up system. Text files can also be read, written to and transmitted via a telephone and modem in standard ASCII format to non-AppleWorks (and non-Apple) users.

The needs of hard-disk owners have

A utilities industry has already grown up around the program

been met from the outset because AppleWorks is readily copyable. The entire program can be put on to hard disk and the original program disks put away forever — a boot disk is not required.

John Pescher, office manager of Australia's largest computer mail-order company, Micro Educational, uses AppleWorks all the time. "In the office we have it on hard disk, which gives the program even greater speed, but at home I just use it on floppies," he says. "We mainly use it for letter writing and

for doing budget projections for the business."

There is no software program in the world without shortcomings, but Apple's name and reputation ensured that any gaps in AppleWorks would be plugged. A utilities industry has already grown up around the program and a few weak areas have been tackled by third-party software and peripheral developers.

The strange and inexplicable omission of a mail-merge facility for the AppleWorks word processor surprised many people, but several companies have come to the rescue. Software Solution's MegaWorks package incorporates mail-merge plus a spelling checker. Haba-Merge is another mail-merge product that interfaces with AppleWorks, but it hasn't arrived in Australia yet.

Sensitive Speller from Sensible Software is an excellent spell-check program that interfaces directly with the AppleWorks files. It is now available in a ProDOS version.

For those who whinged about having only 55K of memory left after the AppleWorks program is loaded, a 1.5 megabyte RAM card is now available in the US and other "optional extras" are in the pipe-line. But I suspect that the vast majority of small business users will be satisfied with AppleWorks plus MegaWorks on a standard 128K dual drive system. (Any thing less than this configuration would be too limiting in a professional environment.)

For the owners of an Apple IIe with only 64K of RAM, Australia's Automatic Ice Company has produced an excellent (100 percent compatible) extended 80-column card which retails at only \$199, half the price of Apple's imported card.

All up, including the cost of MegaWorks, the software comes to around \$500, and for this outlay you get an integrated package with word processor, spreadsheet and database plus a mail-merge program and spelling checker. It is little wonder that it has pushed Lotus 1-2-3 off the best-selling pedestal.

Apple has again challenged the computer establishment by offering one of the most eminently practical yet easy to use programs ever written. The Mac may be getting all of Apple's current advertising budget, but AppleWorks is pretty good evidence that the Series II computers are here to stay. ■

FACT FILE

Product: AppleWorks
Price: \$325
Requirements: Apple IIe or IIc with 128K
Documentation: 322-page manual.
Skill level: Novice
Supplier: Apple Australia (02) 888 5888

Product: MegaWorks
Price: \$199
Requirements: AppleWorks
Documentation: 50-page tutorial/manual
Skill level: Novice
Supplier: Software Source (02) 389 6388
Micro Educational (049) 26 4122

Product: Auto Ice Extended IIe 80-column card
Price: \$199
Supplier: Automatic Ice Company (049) 63 3188



A sensible acquisition . . .

Sensible Software's ProDOS Sensible Speller, based on the DOS 3.3 spelling program of the same name, promises to fulfill the proofreading requirements of most professional Apple II users.

The program functions with ProDOS text files *only*, but this includes most text files created by the current range of ProDOS word processors. In the style of the times Sensible Speller is promoted as "AppleWorks-compatible", but it will also interface with Word Juggler, the ProDOS version of Apple Writer and others. Computer Solutions' Zardax II, version 1.1.3 onwards, is also fully compatible.

Apart from sniffing out typos and spelling errors, Sensible Speller allows you to add words to the supplied dictionary, look up words, and delete unwanted words. There are no Control characters used, so there are none to forget. It is menu driven all the way. The screen instructions are clear, and are set on the standard 40-column screen, which is a plus for users who have to view the IIc's tiny monitor.

The set-up module of the program, which is accessed by pressing the Escape key during book-up, offers a selection of standard formats or a user-configured format. Little could go wrong with setting up the program for a particular type of text analysis; it is all very self-explanatory.

By Neil Munro

Booting the program normally takes you directly to the main menu, which displays five selections: check spelling, list dictionary words, add words to dictionary, delete words, and quit. The default selection "C" places you in the spelling check mode, where the name of the volume and file must be entered. Unfortunately Sensible Speller is not ProDOS-invisible and a knowledge of pathname protocols is required. This is one of the minor irritations of the program, but once you are into the swing of typing out these pathnames and using wildcards, the irritation will pass.

Sensible Speller uses an 80,000-word dictionary split in two and recorded on both sides of a copyable disk. The software designers chose the well-known Random House dictionary for their program and the words contained are all "real" words, not made-up words from tables of roots and suffixes. You shouldn't find any anomalies here.

Special words such as proper nouns can be added to the dictionary at any time, so it doesn't take long to create a completely personalised and very comprehensive dictionary. By the way, the word "personalised" is listed as a "suspect" word on the untouched Random House version. Like most US software,

all the "-ise" words are listed as "-ize".

When "suspect" words are found they are presented on-screen and in context. You can then either accept them, alter them, or ask the program for a suggested spelling. This part of the program works extremely well and is its real strength. The options are clearly presented and alterations to text can be performed speedily and precisely. Misspelled words can be listed to a printer or the screen, or changes can be made directly to the text file. This eliminates the need to "search and replace" them later on.

Wildcards can be used in the "list words" part of the program. The equals sign (=) placed within or at the end of a word will match any number of characters and can be used more than once in the same word. For example, P=LL=ER will list words like painkiller, poller, polluter, pullover, pallbearer, pollster and propeller.

FACT FILE

Product: Sensible Speller (ProDOS)
Price: \$213
Requirements: Apple II with ProDOS word processor
Documentation: Good but largely unnecessary 65-page manual
Skill Level: Novice
Supplier: Imagineering, (02) 212 1411

By Stewart Fist

John MacGibbon's article arrived on my desk only days after I received the enthusiastic review of Sensible Speller from Neil Munro. Since, on the surface, they seem to be in disagreement, I obtained both DOS 3.3 and ProDOS versions of the program for a comparative check. Here's what I found:

□ With an article of more than 1500 words the ProDOS version of the program took 63 seconds to read the file, plus another 65 seconds to check

the file against the dictionary. It claimed that the file had 1671 words.

□ With the same article converted to DOS 3.3, the DOS version of Sensible Speller took 29 seconds to read the file, plus another 38 seconds to check the file against the dictionary. It claimed that the file had 1720 words.

The difference in word counts appears to be in the way the versions handle hyphenation, but the old DOS 3.3 version seems to be running much faster. Why?

The seemingly obvious answer was that the dictionary in the old DOS version was smaller, but on checking this proved incorrect. Anyway, this shouldn't have affected the "read" phase of the operation, since the program is

only collecting and indexing the words in your file at this time.

I put the question to the technical people at Imagineering, and they didn't know either. They have telexed the US trying to get the answer, but at the time of going to press we haven't had a reply.

I suspect that the difference in speeds has nothing to do with the DOS, but is a result of the restructuring of the program at the time of transfer. When I ask the dictionary to list all words, starting with the As and running through to the Zs, it is noticeable that the ProDOS version accesses the disk much more frequently than the DOS 3.3 version. On average the ProDOS version seems to be capable of holding an average of only 160 dictionary words in memory at one

...or is it?

The question mark wildcard (?) is stricter in its usage and substitutes for a single unknown letter. If you were unsure whether it was "audible" or "audable", you would only need to enter "AUD?BLE" to come up with the right answer. Because the "?" wildcard matches exactly one unknown character this function can be useful for one popular recreational pursuit: word puzzles. Purists would call it cheating, but if you ask the program to fill in the missing blanks, it will. A list of five letter words beginning with "L" and ending with "R" takes only seconds.

For those with hard disk drives, the program can be installed and the floppies put away. This concession to copying doesn't extend to floppy disk drive operators (except for the dictionary), but a back-up copy of the program proper is included.

My only major criticism of Sensible Speller has nothing to do with the mechanics of this program, but its price — \$213 is a lot to pay for any utility program, no matter how good. While it is hard to define "reasonable" charges for software, this program is overpriced when compared with similar "intellectual works" on mediums other than magnetic disk. The main "intellectual work" was already largely done in entering the 80,000 words when typesetting the hard-bound dictionary, which costs only about \$30.

By John MacGibbon

Apple's ProDOS is bringing welcome benefits, or so we are supposed to believe. One benefit claimed for the awkward cow of an operating system is faster working programs. So why can't someone write a halfway decent spelling checker for my newfangled, ProDOS-style, word processor files?

The other day I put a 2225-word article on a DOS text file through my ancient (1982) Sensible Speller 3.0. I timed how long it took to get the file, count the words, and compare it against the dictionary. It zipped through the job in 69 seconds.

Then I converted the article to an AppleWorks file and put it through a friend's newer Sensible Speller for ProDOS. Faster still? Well, not exactly; it clocked up 149 seconds, more than double the DOS 3.3 version time. Not only that, but using the program was decidedly messy. It required a knowledge of ProDOS conventions for a start.

Anyway, having negotiated the first part of the checker, I thought I should, being a New Zealander, at least add some Kiwi words to the dictionary disk.

time, whereas the DOS 3.3 version holds an average of 1520 by my calculations — so DOS 3.3 is obviously capable of taking much larger bites out of the dictionary for checking.

But you would expect the opposite to be the case. And the disk access explanation doesn't explain why the "read" phase is faster, either.

Now, as Neil Munro has pointed out, the whole problem is largely of academic interest only, and doesn't alter his claim that ProDOS Sensible Speller is quick and easy to use compared to others.

In my ProDOS test above, the overall time taken, from the time I inserted the program disk until the whole operation was complete — with corrections made to the original file — was 9 min 48 secs.

This was particularly slow because I was using a new dictionary disk that hadn't, as yet, been educated to understand words like "Mac", "micro" and "DOS". Even with 80,000 words, the dictionary needs to be upgraded, because a lot of the time was taken up with manually accepting or rejecting words the computer didn't recognise.

A difference of a minute to this total time hardly constitutes a major disadvantage. However, it is irritating to think that a good program could, perhaps, have been better.

By the same token, Sensible Speller makes corrections directly on to the original file, and not many spell-checkers do this; you usually have to go back into the original word-processor

So I followed the tortuous instructions and was finally invited to build my enhanced dictionary on a new preformatted disk.

Unfortunately I wasn't given the option of doing it on both my disk drives. Put the old dictionary in the drive/put the new dictionary in the drive/old/new/old/new: on and on it went. There must have been at least 50 swaps before I gave up.

There's got to be a better way, I told myself as I trotted off to a friendly computer store in search of the ProDOS spelling checkers. There was only one on offer: MegaWorks, by the Megahaus people, for \$NZ300. In weak defence of the price I should point out that the program also does mail merging — not that I often need such a facility.

I brought out my 2225-word file and booted up MegaWorks with eager anticipation. This early in the financial year the office budget could easily stand \$300 for a worthwhile product. Right from the start things looked better. The screen format was almost identical to AppleWorks, and you didn't have to pussyfoot about with pathnames.

But wait! And wait, and wait . . . some more. To be exact, wait for 568 seconds. Shiny new MegaWorks did the job, and it only took eight times longer than my antediluvian Sensible Speller 3.0, running on obsolescent DOS 3.3. This is progress?

to make the changes. Mind you, you are probably going to have to do this anyway to print the document out.

The 10-minute wait illustrates the problems with spelling-check programs: they are often just not worth the time they take to run. Even at twice the speed they would still be of doubtful use to people who write only short letters and documents.

What needs to be designed is a spelling-checker that checks the files word-by-word from within the word processing program, either as it is being keyed in or after completion — perhaps even as it is being output to the printer. Sensible Speller is one of the best available, but at present that simply isn't good enough. ■

Music from a Mac

By Greg Stone

When I walked into my local computer store and found MusicWorks running on a Macintosh, it was love at first sound. Out came my wallet, and I went home more than \$100 poorer, but rich in the spirit of excitement that had brought me to the Mac in the first place. Here was a simple program for composing, arranging and transcribing music, and listening to the results.

The program gives you:

- ☐ More than 40 musical selections to listen to or modify.
- ☐ Three methods to see your music — an overview window, a conventional staff, and a special grid.
- ☐ Four voices, a composing range of eight octaves, eight different instruments, and 12 ways to play them.
- ☐ Sheet music printouts of individual voices or entire scores.
- ☐ The ability to play an entire song, repeat a song or specific sections, and listen while you compose or edit.

An ability to read sheet music is certainly helpful in using the program, but hardly necessary. Anyone can simply copy music into the program from a published score and then play it, making

Music Works lets you compose, arrange, transcribe — and listen to — your own compositions

simple modifications, such as having one instrument play all four voices or using different instruments for different sections and voices. (The program has a keyboard-like grid system for composition without conventional notation.)

To copy a song from a book or sheet music, you open the MusicWorks icon

FACT FILE

Product: MusicWorks
Price: \$120
Requirements: Macintosh
Documentation: Manual with glossary
Skill level: Novice
Suppliers: Software Corporation of Australia, (02) 328 7074; Myer Melbourne, (03) 66 111

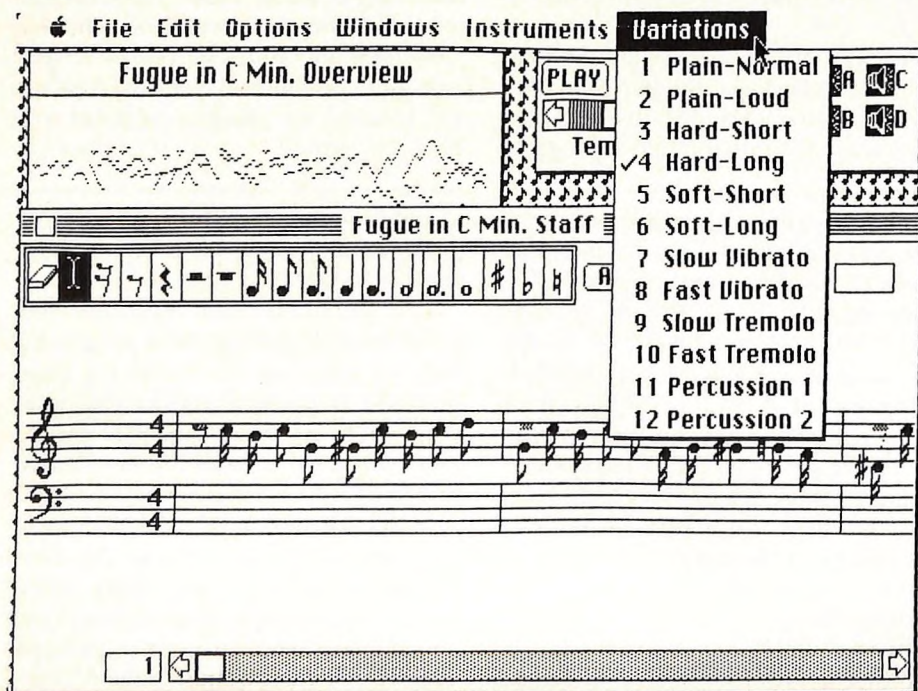
and select Staff from the Windows menu. You are presented with standard treble and bass staves, all blank, of course. Choose Meter from the Windows menu and set the time to match the piece you're copying. Similarly, choose Key Signature from the Windows menu and set the key. (If you don't know the keys by their letter designations, just experiment until the sharps or flats at the start of the staff on the screen match the sharps and flats at the start of the piece you're copying.) Click on the A button to indicate you are about to put in a note for the first voice.

From there, MusicWorks is like a musical version of MacPaint. You point to a note you desire, click on it, move the pointer to the correct location on the staff, and click again. You can erase or reposition the note. You place appropriate rests, sharps, flats, or naturals on the staff in a similar manner. If, at any point, you want to hear what you have put on the staff, just click on the Play button on the control panel.

I had great fun with these steps alone and gained a larger appreciation for music in the process. Two reasons for this increased appreciation were the ability to hear what I had just "written", and the ability to hear any one or more of the four voices I had selected. I found myself listening first to the melody and then going back and listening to one or more of the other voices. (You can select the third voice, for example, and also highlight that voice alone on the musical staff.) Finally, I put it all together and really heard the piece for the first time, for my ears were now much more sensitive to all that was happening musically, rather than being focused on one portion of the music.

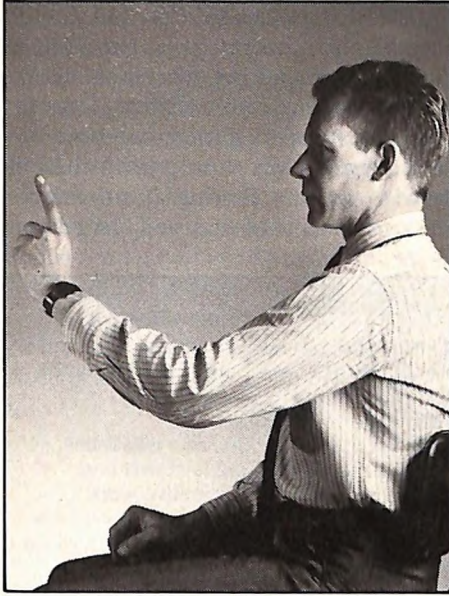
Changing instruments for portions of music is also enjoyable. The differences here are sometimes subtle, but you can create the changes so quickly that comparing instruments is simple. The program comes with eight instruments, but you can create your own unusual sounds with the two synthesizers provided, simply by drawing wave forms.

Two other windows provide visual representations of the music. One is an Overview window, which looks like a flattened drum of a music box. The staff

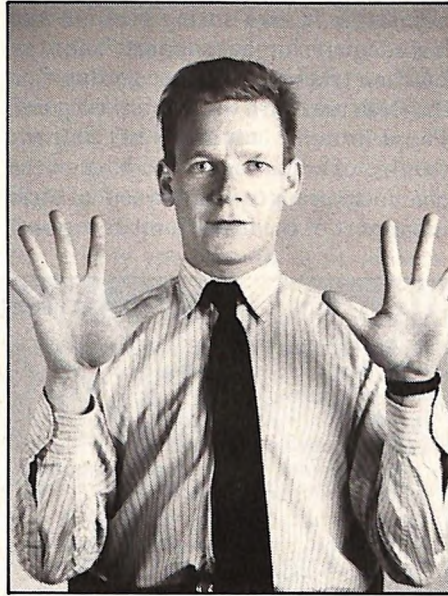


The MusicWorks screen

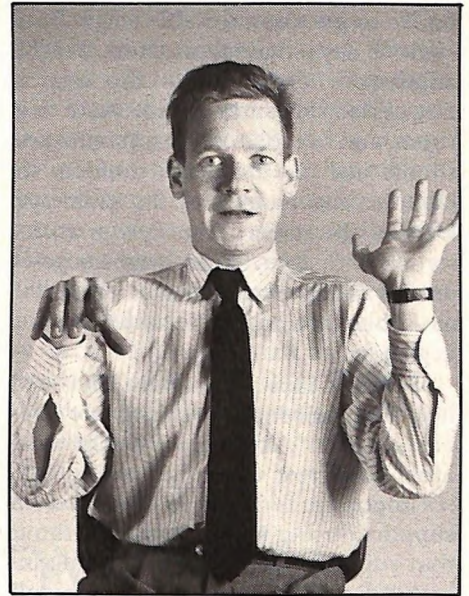
ERGONOMICS



Stretch one arm out, focus on your index finger tip, then bring it to your nose, watching it. Repeat five times.



Rest elbows at your side. Raise the hands in front of your face, palms away from the body, wrists straight. Spread fingers widely apart, hold for a second and return together. Repeat five to 10 times.



Rest elbows at your side. Raise hands and relax fingers. Bend wrists back as far as comfortable towards the face, hold for a second, then allow to flop forward. Repeat five to 10 times.

tional stress of the job, work breaks, room temperature, lighting, and workstation design. This is known as creating a sound ergonomic environment.

People who study the inter-relation of the worker and the working environment and make recommendations to optimise safety, health, comfort and efficiency, often call themselves ergonomists, but there are few that are actually qualified. Most have skills in occupational health and safety, physiotherapy, engineering or psychology.

Leading occupational physiotherapist Amanda Gore says people have to be wary of claims made by furniture suppliers. Despite the heavy emphasis on ergonomics in the advertising of office furniture, Gore says there is no such thing as ergonomic furniture. "No piece of furniture will solve your RSI problems and, while individual pieces of furniture may incorporate sound ergonomic design principles, each must be selected to suit the total working environment," she says.

Gore is an occupational physiotherapist and chairman of the National Special Group on Ergonomics and Occupational Health (a sub-group of the Australian Physiotherapy Association). She is also honorary secretary of the Ergonomics Society of Australia and New Zealand (NSW branch) and is an

How to know when you are in a high-risk area

- ☐ You run an office environment with a lot of keyboard activity, but you think RSI is an excuse for malingers. Suspicion is the surest way to put extra stress on your employees.
- ☐ Your keyboard operators are carrying out high-frequency repetitive work for long periods.
- ☐ You don't have a program of rest breaks at the terminals.
- ☐ You monitor individual rates of work keeping staff under constant pressure.

- ☐ Your work furniture is poorly designed, ergonomically unsound and puts extra stress on various joints of the body.
- ☐ The type of work involves several repeated movements using a minimum number of muscles for a long period.
- ☐ You haven't given adequate training periods to staff doing specialised work.
- ☐ Constant tension or static loading of muscles in the trunk, shoulders and arms are an unavoidable factor of keyboard work in your office.

occupational physiotherapist with Australia Post.

"My personal opinion is that one of the basic problems with finding ergonomic solutions is lack of facts," says Gore. "We don't have any concrete data that says you have to sit a particular way, or your desk should be X high. I believe sound ergonomic principles are that you build in maximum flexibility to any workstation or environment that you are constructing or adjusting."

Gore says there is understandable confusion in the marketplace. Prices of modern desks range from \$200 to \$850 and chairs range from \$90 to \$250. Some desks require document holders; others need footrests because the desk height is not adjustable. And the designs

vary as much as the prices.

The E. W. Watts desk, which Federal Government departments mostly use, and the Co-Design chair are the two Gore selects, because she says they have the most flexibility. "If an employee's duties cover word processing, clerical and some retrieval work, the desk requirements are different. That's why it's important to have flexibility in office furniture.

"A word-processing operator needs a desk that is low enough for the arms to be at right angles to the body, whereas a clerk needs a desk higher, so that she is not bending down to write. If the desk height is adjustable, it's ideal for both tasks. If not, the employee has to prop up her PC and feet with telephone

ERGONOMICS

books to get a comfortable height."

Gore says that apart from height adjustment, desks should also have a non-reflecting surface, adequate leg room, and rounded corners. Employees should also use document holders so that the document is at the same eye level as the screen. She says a workstation with a keyboard height adjustment is an improvement on a traditional desk, but would only be suitable for a keying in.

Gore says most desks with a keyboard height adjustment have inadequate forearm support. "Although keyboard operators don't rest while they are keying, it's important for them to have forearm support during short pauses. Without that support, the hands are relying on arm muscles to hold them up. This is all right for short spells, but for long periods static muscle loading can occur. It's a bit like holding your arm out in front of you for long periods — it gets very tired."

She says there is a large range of chairs on the market. "Management should find a chair that is easily height

adjustable from a sitting position and has adequate lumbar support," she says. "A chair where you have to get down on the floor and turn the knob is no good. People become lazy and won't go to the trouble of adjusting it. The back of the chair also needs to be tilted so that there is support of the lower lumbar region."

Several companies produce height adjustable chairs operated by a gas cylinder pump, which allows the height to be adjusted easily from a sitting position.

Once the workstation has been selected, employees should be instructed how to use it. "Having an adjustable desk or chair is of no use if the person

Symptoms related to keyboard use

A repetition injury usually shows up as pain, swelling or numbness in or around the affected muscles or tendons. This usually occurs in the fingers, one or both hands, wrists and/or arms.

RSI is commonly referred to in terms of the stage and degree of the injury. These are not fixed but are recognised by ergonomists and used by the Australian Public Service Association to provide a reference for diagnosis, treatment and rehabilitation.

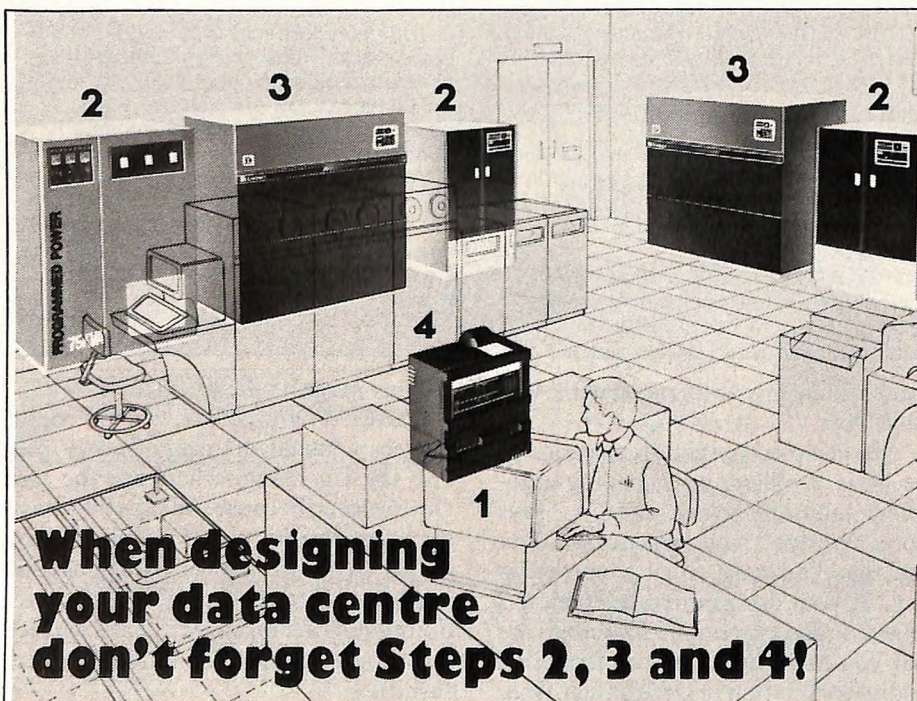
□ Stage 1. Pain occurs during work, but may stop with rest (for example, symptoms disappear overnight or on weekends). At this stage there may be minimal or no reduction in work performance.

□ Stage 2. Pain occurs while working and continues after work but may stop by the following day. The ability to perform repetitive work declines.

□ Stage 3. Pain, fatigue and weakness continue while the limb is at rest and abates more slowly. Repetitive work cannot be done — the worker needs time off, but may return to a modified job when night pain stops.

□ Stage 4. Pain, fatigue and weakness is unrelieved except by lengthy periods of rest. The worker is unable to work for months or years.

□ Stage 5. Chronic and persistent condition. The affected limb will have no functional use. People suffering from stage 5 injuries rarely return to the workforce.



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does not know the best height to adjust it to," Gore says.

This same flexibility must also be considered when setting lighting and room temperature. Gore believes people should always be at right angles to a window, not facing a window. "Then the light goes straight past you, it doesn't reflect off at an angle," she says.

Overhead lighting should be designed so that it has luminaires to filter the light and diffuse it. Although adequate general lighting levels are required, Gore says you often need to have individual task lighting. "It's really important to

have a level of control over your environment," she says.

Gore believes it is not ideal to have lights directly overhead because of reflections off the keyboard. "If you have to have the lights overhead, have them slightly behind the operator so the shadow stops some of the reflection. But ideally you have them in between the workstations."

Another factor affecting the workers' well being is room temperature. Gore says that because VDUs put out heat, room temperature varies depending on the number of VDUs in the room. The

ideal is 22 to 23°C in summer and 19 to 20°C in winter with humidity at 40 to 60 percent. "Humidity plays an important role because if humidity is low all your mucous membranes dry out, your eye membranes dry out, and that adds to your fatigue." Gore says it is also important to make sure there are no draughts from the air-conditioning.

Finally, management should consider the workload and the stress on the worker. Although a staff member may go all out to get a job done, if she or he develops RSI the company can be held responsible.

Injury can hit anyone

Repetition strain injury (RSI) can strike anyone involved in rapid, repetitive movement, such as a keyboard operator, a production-line worker or a storeman. But this much-talked-about conditions does not have a set definition.

The NSW Department of Industrial Relations division of occupational health says RSI is "musculotendinous injuries of the upper limbs, shoulder girdles, and neck caused by overload of particular muscle groups from repeated use, or by the maintenance of constrained postures, which result in pain, fatigue and a decline in work performance".

The most commonly discussed form of RSI is tenosynovitis, but it is only one of a range of conditions that can affect workers performing repetitive tasks. Tenosynovitis, if ignored, leads to obvious inflammation and scarring of the tendon sheath and the tendon itself. One theory is that the damage to the tendon results from the impaired capacity of the sheath to secrete the necessary fluid for smooth movement of the tendon.

Very few workers get pure flexor tenosynovitis by itself; they usually develop a combination of repetition injuries, induced by compensatory movements of the body made to avoid the pain. Often workers with primary flexor tenosynovitis (inflammation of the sheaths of the tendons that cause the fingers to bend) also develop tendonitis (inflammation and thickening of the tendon itself) or, more commonly, peri-

By Helen Grant

tendinitis, which is inflammation of the junction between muscle, tendon and surrounding tissue. Sometimes symptoms may involve the shoulder joints and neck muscles and joints (rotor cuff strain, frozen shoulder and tension neck syndrome).

Other forms of repetition injury include De Quervains Syndrome, which is inflammation of the thumb's tendons, Carpal Tunnel Syndrome, characterised by the entrapment of the tendons and

If diagnosed early, progression can be halted

median nerve entering the hand, and epicondylitis, otherwise known as tennis elbow or golfer's elbow.

Early warning signs are recurrent or persistent. They include local fatigue or discomfort, heaviness, weakness, tenderness, tingling, pins and needles and swelling in the neck, shoulders, upper arms, forearms, wrists or fingers, loss of co-ordination of the muscles, or recurrent muscle stiffness or tightness. If diagnosed early, progression can be halted. Once in the advanced state, the sufferer risks permanent disablement.

The exact causes of RSI are unknown, but factors believed to contribute include poor posture, mental or emotional

stress, lack of variety of work, lack of work breaks, incorrect air conditioning temperature, poor workstation design, poor lighting, static muscle loading (constant tension), the number of repeated movements and the amount of excessive effort used (bashing keys).

Muscle tension can be measured with a device called an electromyograph, which picks up electrical signals from muscle contractions. David Brown, a scientist and psychologist at the Group Occupational Health Centre at Mascot in Sydney, says one of the biggest advantages of this system is that people can see their own stress levels. "With muscle tension measurement, we could try out different keyboards and seat heights and measure the effects these changes had on that person's muscle tension," he says.

"We then show the person their tension readings when they perform the job in their habitual way, and ask them to try a relaxed position. This could be dropping the shoulders, hanging the elbows, softening the touch, or just generally relaxing. It could also be adjusting the workstation to suit the person."

Brown says this is a cost-effective method. "People don't always need to go out and buy new furniture — sometimes they just need small modifications to the workstation," he says. The electromyograph sells for \$855 plus \$120 for training and recommendations. Brown and his partner, Dr Robin Mitchell, have sold 110 machines. They also do consulting on a regular basis.

Tenosynovitis and RSI: Nobody knows the cure, but Brownbuilt has the ergonomic solution.



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Heed the early warnings

By Helen Grant

Lorraine Powell is an RSI sufferer who was ignorant of the early warning signs. Today, doctors say she cannot be cured.

In 1982, Powell, then 27, was working in a bank, processing cheques. The job was repetitive, with constant use of her right hand to key in details and of her left hand to process the cheques. During her six years with the bank, Powell had not been given regular work breaks and had not been told about the warning signs of RSI. "We worked until all the cheques were processed," she says. "That could be anything from four to 12 hours. During that time we only had the union award breaks that were in at that time."

Powell says she had a lot of pain before reporting it to management. "I didn't report it because I didn't know what it was," she says. "In the beginning the pain would come and then go away. I thought I was just tired."

It wasn't until the pain kept her awake at night that Powell went to see a doctor. "I had shooting pains up my arm and pains in my wrist. When I was doing things, my fingers would just lock up," she says.

In May 1982 she made an appointment to see a general practitioner. He diagnosed her as having tenosynovitis and recommended that she have two weeks off work. When she told her boss about her injuries he was sceptical. "The management at the time insisted I got it from something else," she says. "He (the manager) made a lot of disparaging comments about my character and how people got along with me. He even said I had been machining the wrong way.



Lorraine Powell: "If I go out to a restaurant I have to think about what I order."

The point is that they trained me to machine that way."

After two weeks, Powell returned to the doctor. By this stage he had given her anti-inflammatory drugs, but her condition had not changed. She was told to stay off work and wait until there was improvement. But there was no improvement. Lorraine felt helpless and depressed. "I sat at home and waited, and hoped it would get better. It was pretty devastating."

Powell's injuries did not improve, and she needed help around the home. Fortunately, her workers compensation paid for arm splints, tap turners, special

knives and a bottle opener.

Continuous trips to the doctor proved fruitless, as did visits to other doctors and specialists. By the end of 1983, Powell had seen an acupuncturist, a chiropractor, a specialist at a rehabilitation centre, a pain clinic and an occupational therapist. They confirmed her GP's diagnosis, and told her to rest and take more painkillers.

Powell says she was lucky that she found a doctor who knew what to do about it. "I was told rest was important," she says. "I had obviously worked too long so my injury was severe. But to be told to go off and rest and they don't

What to do if you think you have RSI

- ☐ Report the symptoms immediately to a supervisor or your company's medical officer.
- ☐ If there is no resident medical officer or occupational health officer, ask to be referred to an occupational physiotherapist.
- ☐ Call one of the RSI support groups listed in the back of this lift-out.
- ☐ Do not treat yourself as an invalid, but use common sense and don't aggravate

the condition unnecessarily.

- ☐ Think about what aggravates the pain and avoid those activities.
- ☐ Your understanding of the problem is essential — once the problem has been diagnosed (by someone with expert knowledge in the field) ask the physiotherapist what you should and shouldn't do.
- ☐ Follow the rehabilitation program strictly. This is vital to your return to work.

THE RSI HANDBOOK

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ERGONOMICS

know how long it is going to go on for is very hard to cope with."

Powell then applied for another job at the bank, but was told computing was not suitable work for her. She was not given alternative duties, and she became more depressed and angry.

Since late 1983, Powell has been working for an RSI support group called WRIST. "We have three full-time people who have had RSI and we have an administration office person who does all the repetitive things we cannot do," she says. "I now give support to people with RSI. I tell them who to see, explain their rights to them, give them information on aids to help them. I also do a lot of public speaking and education about the injury."

At home, Powell still has difficulty using her hands. "I wake up in the morning to clean my teeth and I have pains. I have difficulty with housework and I have to think about everything I do. For example, if I go out to a restaurant I have to think about what I order. If I order a steak, it's difficult to

cut, so I have to ask somebody to do it for me. Opening and closing doors is difficult, so I usually open doors with my feet.

"The most frustrating thing is I don't know when it will end. I go to the doctor every few months but there's nothing they can do."

Where to get help

ACT

ACT RSI Support Group Incorporated, 8 Taylor Place, Hackett 2602, phone: (062) 49 1028. President: Maureen Thomas.

NEW SOUTH WALES

Tenosynovitis Association, 21a Shepard Street, Chippendale 2008, phone: (02) 212 2558.

NORTHERN TERRITORY

Carol Webb, Motor Vehicle Registry, PO Box 530, Darwin 5794, phone: (089) 89 7923.

June Tomlinson, Word Processing Supervisors Group, c/o Department of Education, GPO Box 3988, Darwin 5794, phone: (089) 80 4437.

Edwin Hails, c/o Transport and Works

Store, Armidale Street, Parap 5790, phone: (089) 89 7646.

QUEENSLAND

Queensland Overuse Injury Group, c/o Queensland Workers Health Centre, 5th floor, Trades Hall, Edward Street, Brisbane 4000, phone: (07) 831 5199.

SOUTH AUSTRALIA

APSA RSI Support Group, 81 Currie Street, Adelaide 5000, phone: (08) 51 9904.

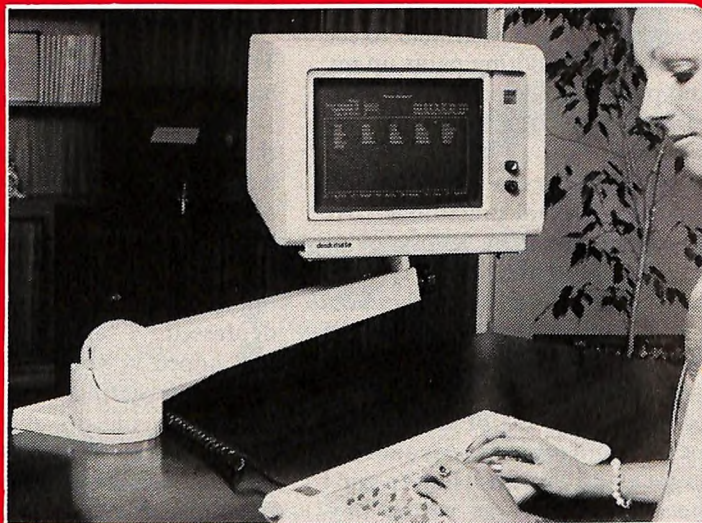
VICTORIA

APSA Victorian Branch RSI Support Group, PO Box 355, Carlton South 3053, phone: (03) 347 0333. Contact: Lance Kenningham.

Women's Repetition Injury Support Team (WRIST), 272 George Street, Fitzroy 3065, phone: (03) 419 5440. ■

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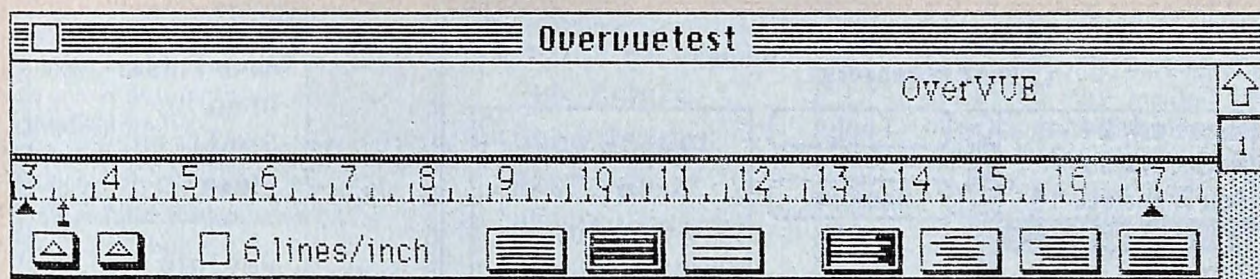


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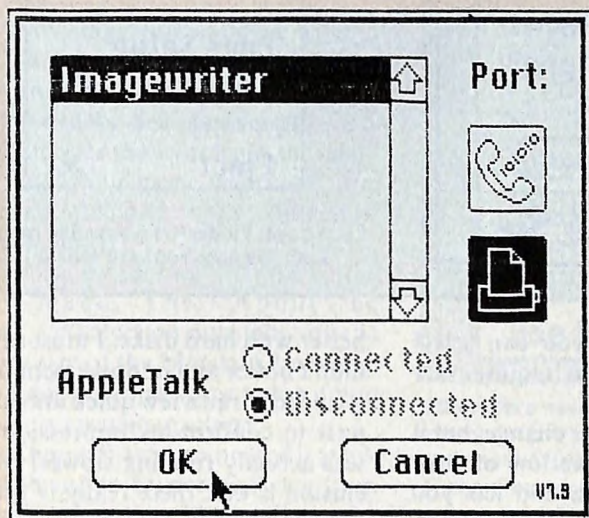
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DEALER ENQUIRIES WELCOME



Above: MacWrite's new metric rules offers 6 lines/inch spacing and gives the page number in the scroll box



Above: Finder 4.1's new Special menu; Left: the Choose Printer dialogue box

Mac software updates

As this edition goes to press, Apple is on the verge of making several new software releases that, while not earth-shattering, will alter the way of working with the Macintosh.

There is no fresh news about Switcher, which will apparently be released in the public domain simultaneously with the release of Microsoft's Excel (initially they will be packaged together), but the disk-based MacWrite is here now, as is Finder 4.1 (albeit with some minor bugs if you try to run it with a Tecmar or Corvus hard disk or the 2.2 version of MacWrite).

MacPaint has also been changed and upgraded, but Apple hasn't given any details and from my limited experience with the new program I can't detect any differences.

Disk-based MacWrite

The original version of MacWrite

By Stewart Fist

MacWrite is now disk-based, and a new version of the Finder promises faster operation

was given away free with every Mac computer, and some of the more unkind critics muttered that that was just as well, as they never would have been able to sell it. I have never used it on the Mac by choice since Microsoft Word arrived and, in fact, I still prefer to write articles on my Apple IIe with AppleWorks.

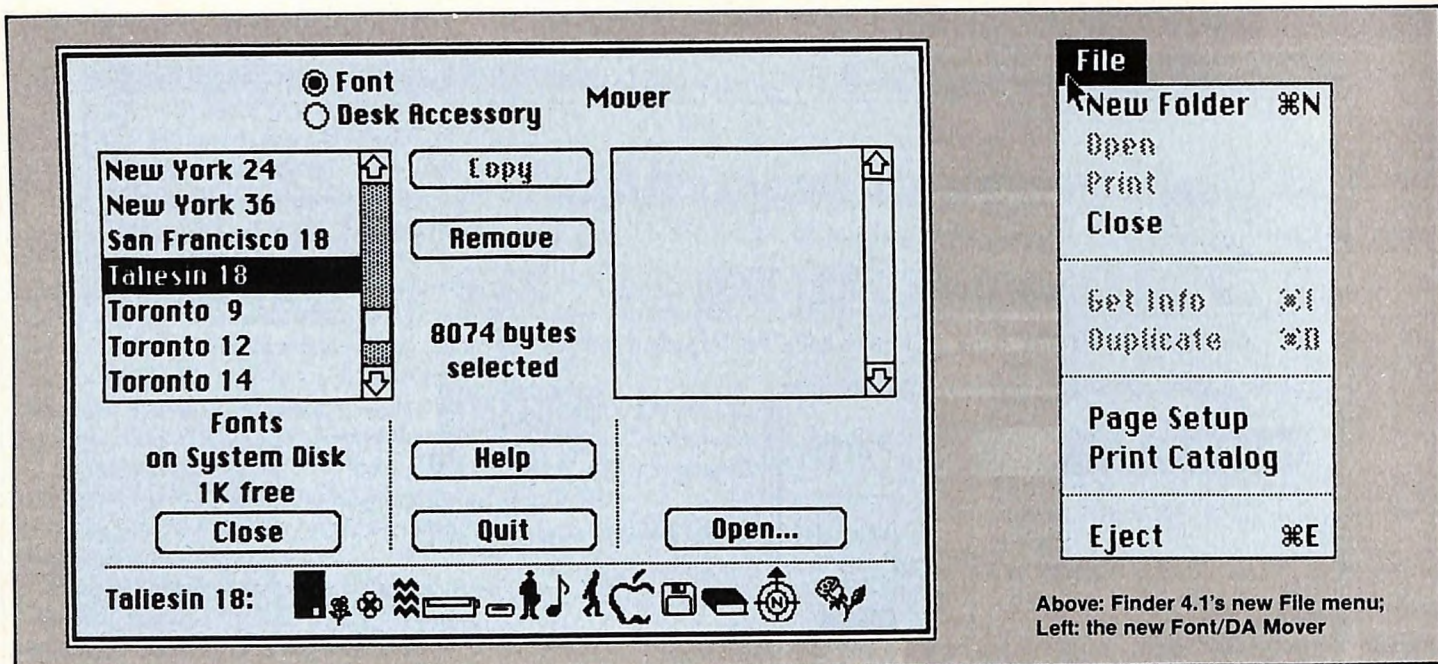
But the great day has arrived, and Apple has unveiled the new version of MacWrite — version 4.5 — which is “disk-based”. All this means to you is

that long documents can be held partly on disk and brought through into memory when required.

Document size on the old MacWrite was limited by the free RAM space in your Mac. With the new version, you can have up to 250 typewritten single-spaced pages as one file, and the program will shunt it to and from disk as you work.

To the average letter-writer, this will make absolutely no difference at all; you will notice it only if you are writing long reports or a book. Even then, the sensible thing to do is to break a book into chapters and handle it a chapter at a time.

To use the new MacWrite with old MacWrite document-files you must convert them, and there is a built-in conversion program on the disk. When the file has been converted it must immediately be renamed, since the old Mac-



Above: Finder 4.1's new File menu;
Left: the new Font/DA Mover

Write file remains on the disk until you trash it. When you have converted a file it can then be used only with the new version of the program; you can't change it back to the old format.

In terms of the commands and controls, Apple has made several enhancements to the Format menu. You can now change the alignment of selected areas of text without inserting a new ruler. These commands over-ride the alignment settings on the current ruler for all text following the selection point. To revert to the original settings you simply choose the Use Ruler command.

You have your choice of Align Left, Centre, Align Right and Justify. What is more, there are command-key combinations as well as mouse selections for these text formatters, so with experience they are quick and easy to use. While it was revamping MacWrite's commands, Apple corrected one minor irritation with the Search feature. You now have both a Find Next and a Goto Page # command.

The new Find Next command lets you continue searching through a document for the occurrences of a word or letter sequence without having to reopen the Find window (it is easier still to use the command-key equivalent, Command-F).

To me, the most useful enhancement is also the most visually insignificant: a page number in the scroll box on the right-hand side of the screen. The number changes as you drag the scroll

box up or down, so you can select exactly which page you require very easily.

It is a seemingly minor change, but it gives you a clear indication of how much you have written, and lets you quickly find words that need spelling correction after having proof-read a print-out. It is so simple, yet so effective.

The new MacWrite allows you to compress the lines of text to the standard typewriter single-spacing of six lines to the inch if you so require.

Finder 4.1

Copies of Finder 4.1 have been circulating around the Apple user groups for a while, but I couldn't get a copy out of Apple for review until now, and this is still a pre-release copy.

The problem appears to be the old one of finding last-minute bugs in the system. Apple is obviously trying to iron out all the problems before the Finder 4.1 goes into general release. It is an operating system, after all, not an applications program, so it should be right.

At present Finder 4.1 doesn't work with the Tecmar or Corvus hard disk, or with MacWrite 2.2. The Corvus problem is a Corvus software bug, while the other two are problems in the Finder. The new Finder disk also includes printer selection files and a Font/Desk Accessory Mover — and all I can say is: about time!

Apple claims that the new Finder is faster than the old version and works

better with hard disks. I must say that I didn't notice any improvement in speed — in fact, I ran a few quick uncontrolled tests to confirm my impression that it was actually running slower! My conclusion is that there really is very little difference in speed for most applications. I don't have a hard disk so I can't tell you what difference it makes there.

The claimed speed difference may come from the added feature called MiniFinder, which lets you move quickly between applications and documents you use most often. The new Finder and MiniFinder work with any existing applications and documents. You simply copy over the new System, Finder and Imagewriter icons to all Startup disks.

Finder 4.1 lets you duplicate, move, rename or discard documents, folders and applications from the desk-top with the directory arranged by name, date, size or kind. Previously you could only do this when the directory window was showing icons.

Apple has also redesigned text-directory windows to include a small icon on the left-hand edge, and if the file is locked you will see a small padlock on the right. If the disk itself is locked, a padlock also appears in the top left corner just below the title bar.

Apple has also cleaned up a couple of minor annoyances. It is now easier to rename documents — you just click explicitly on an icon to edit its name, even if the icon is already selected. Less



mistakes are possible with renaming, also. If you have thrown a file into the trash can, and you accidentally use the same name again on a new document, the trash can is automatically emptied to stop duplication.

Eject now always ejects a disk, even if none is selected at the time. When you first select Eject, the Finder will look for the selected disk, but if it doesn't find one it ejects any inserted disk. The second time Eject is selected, it ejects the other disk.

If at any stage you want the Mac to forget about a disk, you can drag the disk icon over to the trash can. This doesn't erase the disk, but simply ejects it and removes the icon from the desktop. The various menu selections have also been changed, with some new functions added.

There are two minor changes to the Apple menu. The "About the Finder..." selection now tells you the memory size of the Mac you are using, which I suppose has some value if you are using a strange machine.

The Choose Printer command is available both in the Finder and also from any application program running under the new Finder on an updated disk. If you use only an Imagewriter, you probably won't use the Choose Printer command or the desk accessory that goes with it.

The Choose Printer desk accessory gives you control over an AppleTalk connection, and allows you to run non-standard printers (for which there must be a printer resource file on the current disk). Printers like the LaserWriter come with an installation disk that modifies the accessory so that it recognises the new machine. Using this desk accessory you can also designate the modem port for the ImageWriter.

In the File menu, the addition of a New Folder command now means that you can create a new folder without having to duplicate an existing one. New folders appear in the frontmost window and can be renamed in the normal way.

The Page Setup command lets you design the orientation and size of directories you print using the Print Catalog command. This is only possible from within the Finder; within an application a document is controlled by the Page Setup command.

Close All and Put Back have been



MacWrite's new Format menu

removed from the File menu, and the Print Catalog command lets you print the contents of an active directory window, whether the directory is in the icon or written format.

The MiniFinder command on the Special menu is probably the most interesting addition to the new version of the Finder. It allows you to move quickly between applications. First, you must select the applications or documents you want to include in the MiniFinder sub-set. You can have up to 12, but since you can quickly and easily change them at any time, you will probably select only those you are currently working with.

The only requirement is that you select all from the same directory window, so you will have to drag them there before selection in some cases. The application must be on the same disk as the documents, although you can move between disks in MiniFinder.

Once your selection has been made, choose MiniFinder from the Special menu, then click on Install. The next time you boot this disk, the MiniFinder screen will appear instead of the usual desktop. You can then select by clicking on any of the icons or by using the Open button.

The value of MiniFinder will probably become even more apparent with the

arrival of Switcher. Switcher lets you put up to four application programs into memory at any one time and to switch instantly between them, so a quick and easy method of selecting these applications will be a boon.

Also in the new Special menu is a Shut Down command, the rumored arrival of which attracted more industry comment than all the other changes put together. This is a pretty good indication of the annoyance of users at the slow disk-access and time-consuming house-keeping that the Mac engages in when you try to power down or swap applications.

Shut Down gives you a quick way to power-down the system if you are planning to reboot a different startup disk. Shut Down saves everything first, then ejects the disks and restarts the Mac.

The Font and Accessories Mover

By now most Mac owners will have had their fill of the majority of the disk accessories, and will be anxious to dump a few to free more space in the memory and on disks. With the new Finder you get a Font and Accessories Mover that lets you do this.

On my Mac I can cheerfully get rid of the Puzzle, the Calculator, and the Alarm Clock. I use the Control Panel on rare occasions and the Note Pad not much more often; only the Scrapbook gets regular use.

The Font/DA Mover presents you with a big dialogue box that is almost self-explanatory.

First, the dialogue window gives you the opportunity to select either fonts or desk accessories. When you select a font, the mover throws up a sample of the font type across the bottom of the screen, which is a great way to confirm that you are removing or copying the correct font. In the figure on page 86 I have selected one of the new icon-type fonts, Taliesin, and you can see samples of the font across the lower part of the window.

From here it is just a matter of clicking on the Copy or Remove command, and the job is done. You can use the Eject or Drive buttons to look at font and accessory files on other disks, and the Font Mover program can be copied to any other disk. You can still transfer fonts with only one disk drive since you have the opportunity to select and open a font, then eject and replace the disk. ■



Friendly power

I have just discovered a new and highly efficient way to review Mac software. What is more, it is probably as accurate as the traditional slog of working through the tutorials. I simply weigh the manual! Anything below 400 grams shows that the program is well designed. The conclusion is axiomatic; the program doesn't need those reams of paper for you to learn how to use it.

Omnis 2's manual weighs 354 grams without the ring binder, and for a database management program this is a considerable achievement, especially since the manual is well laid out, easy to read, and even I can understand it.

What triggered this revolutionary new idea in computer software evaluation was a couple of weeks of mind-boggling effort wading through the manuals and tutorials of MacLion. I hadn't woken up to the reviewing shortcut at that time, so I can't tell you the comparative weight, but the mental effort alone that went into the MacLion manuals would have raised their weight a kilogram or two.

Of course, Omnis 2 isn't a relational database manager on the level of MacLion, although its recent upgrade/partner, Omnis 3, is supposed to be every bit as comprehensive. But, by the same token, Omnis 2 will do most of the tasks possible with MacLion, with one fiftieth of the effort. In fact Omnis 2 on a Mac would come very close to dBase III

By Stewart Fist

The Omnis 2 Mac database has a surprising level of complexity and sophistication

on an IBM for 95 percent of applications, and would perform most of its functions faster to boot.

Omnis 2 is an excellent program in its own right. I haven't had a look at Omnis 3 yet, but do not simply assume that it will necessarily be better than Omnis 2 for your application. Unless you have some quite complex and difficult task, you will probably be better with the simpler program. Having complex query languages and relational capabilities are fine if you need them, but they are a nuisance if you don't.

Like many Mac programs, the apparent simplicity of Omnis 2's operations is deceptive. If you have been around computers for several years you tend to automatically relate sophistication to complexity, but with the Mac that is no longer true. Still, the lack of a complex query language put me off at first: I am conditioned to thinking that database programs without programmable query

languages are little more than file managers. So it was a real eye-opener to see how effective a menu-driven program with a clever design concept can be.

Omnis 2 achieves a lot by good design of the database structure and by providing a range of selectable field attributes. This idea of "attributes" has been growing steadily during the past 18 months, and it is an excellent way to make database programs relatively fool-proof.

The program also uses up to 12 "screens" to show different areas within any one database. A single "screen" is a window that shows only a limited number of fields, so with a complex database having the maximum of 120 fields, you could divide them to provide only 10 fields to each screen. This is the Omnis 2 equivalent of the relational databases that link separate files together, and the technique seems superior.

There is an excellent form of password protection built in to the program. You can allocate a master password and up to four user passwords. Each of the user passwords can be extensively defined to allow access only to certain fields, certain report options, and certain entry and modification functions.

For instance, a password holder can be locked out of the accounting areas of the database, and can be prevented from deleting or editing data. The range

Correction to Mac database feature

The report card on Macintosh databases in last month's issue contained several errors. The correct version is printed here. Also, in the table of additional features, File-Vision, Helix, MegaFiler, Microsoft File, Omnis 2, Omnis 3 and OverVUE were shown as having no mailing label capability. They do, in fact, have this capability, and should all have been rated "good".

REPORT CARD													
	DBMaster	File/Vision	1st Base	Helix	I Know it's Here Somewhere	MacLion	Main St. Filer	MegaFiler	Microsoft File	Omnis 2	Omnis 3	OverVUE	PFS:file
Power	●	◐	●	◐	◉	●	◐	◐	●	●	◐	●	◉
Performance	◉	◉	●	●	◐	●	◉	◉	◐	◉	◐	◐	◐
Ease of learning	◉	◉	◐	◐	◐	◉	◉	●	◐	◉	◐	●	◐
Ease of use	◉	◉	●	●	●	◉	◐	●	●	◉	●	●	●
Integration level	◉	◐	◉	●	◉	◉	◉	◉	◐	◐	●	●	◉
Reports	◐	◉	◉	◉	◐	◉	◉	◉	◐	◐	●	◐	◉
Data transfer	◉	◉	◐	◐	◉	◐	◉	◉	●	◐	◐	◐	◐
Use of Mac interface	◉	◐	◉	◐	◉	◉	◐	◉	◐	◉	●	◐	◉
Documentation	◉	●	●	●	●	◐	◉	●	◉	◉	◉	◐	●
KEY	◉ awful ◐ poor ◐ average ◉ good ● excellent ◐ outstanding												
Report Card rates each of the 13 database programs in general categories													



of password options available is extensive, and since a database should be central to most company's operations, this range is essential. Naturally, the master password holder can access all fields and functions.

This system does not provide total security, of course; Omnis doesn't encrypt the datasets and therefore someone with another type of program could possibly use it to access the stored data. But the level of protection is impressive, and probably quite adequate for most business users.

Like most database managers, Omnis divides records into fields of a selectable, but fixed, length. You can have up to 120 fields in a database, and fields can be up to 60 characters long for a character field of 11 digits for a numerical field.

You can define a field-type as being character (alphanumeric), numeric (with a specified number of decimal places — up to six), date, Boolean and sequence. The first three field types are common to many database managers, but the last two require some explanation.

Boolean here is another name for a logical field-type. It can store only yes/no or true/false arguments in the form of a one or a zero. The sequence field-type is excellent and is an idea that could well be copied by other programmers. It is simply a numerical counting field that starts at one and increments with each record.

What makes this sequential field different from the record number of dBase II and some other programs is that the sequence number is *attached* to the record and can't be edited, which serves to provide an audit trail and to prevent tampering with the database.

These basic field types can further be qualified by "attributes", which serve to control the data from the moment of entry. One of the major purposes of applying attributes to a field is to ensure that the data entered conforms to both the program's, and the user's, requirements.

If you need, for example, to have all surnames in capitals for later searching, it is far better to have a system of checking during entry. If you don't do this you will have to run specially written purge, calculation or data message programs at a later date to get your data into line.

Omnis 2 groups "indexing" as a field

attribute — and of course it is — but for some reason database programmers and users generally haven't thought about indexing in this way in the past. It has always been seen as a separate function. You can index up to 10 fields in any database, but each index increases the memory cost in terms of disk space, so you don't index unnecessarily.

A field can also be identified as "unique", which is a neat way of pre-

Omnis's 'calculated' attribute provides a lot of the program's power

venting duplicated entries. Unfortunately there is not a "non-unique" attribute, which was an excellent idea incorporated into OverVUE.

Omnis's "calculated" attribute provides a lot of the program's power. In calculated fields the value entered derives from a formula using the data in other cells, rather than directly from the keyboard. The range of possible formulas is quite extensive, since you seem to have a fair number of the Basic string and arithmetical commands at hand. For instance:

PROFIT/COST*100

will provide you with the percentage, assuming that both profit and cost were numeric fields in the database.

CON(MID(LASTNAM, 1, 3), SEQNO) is used to provide a unique reference code consisting of the first three letters of the client's last name, concatenated with the unique sequence number.

To anyone with Basic experience, the "calculated" functions of ABS, INT, LEN, MID, and POS, will be familiar. In addition, Omnis 2 uses full arithmetic and Boolean operators, including NOT, CON for concatenation, CHK to check ASCII order of characters, UPP for converting strings to upper case, DAT for date, and DTD, DTM, DTY for the day, month and year components.

By applying these as formulas to a calculated field you can control, massage and manipulate your information with amazing dexterity and yet this is the closest that the program gets to having a higher language level.

In Omnis 2, the fields can be either

fixed or temporary. A temporary field exists within the record only while it is active, but the information held in that field is not stored to disk. You create temporary "calculated" fields to hold results that might later be used in another form.

Temporary fields are the Omnis equivalent to dBase's memory variables, but here they are in a more finite form since they are resident in the program records until the computer is switched off. This is a much better way to handle variables.

Other useful attributes are "upper case only" (for general, rather than calculated, fields), "negatives allowed" (without this only positive numbers can be entered), "zero shown empty" (which blanks trailing zeros), "delete protected", various "justifications" (set copy left, right and centre), and a "default:check".

This last deserves special mention; it is really two attributes in one. You can assign default values to any field. Character defaults must be enclosed in single quotation marks (default:check 'Sales' will automatically enter the word Sales into a field unless the data is overwritten) while numeric defaults are without quotation marks.

The check function evaluates the data at the time of entry and determines whether it is acceptable or not. When you assign these, the check function must be separated from the default by the use of a colon.

An example is in order. Let us suppose that we have a field called SALARY, and we have provided it with the following attribute:

Default:check 9750:(SALARY>=6000) &(SALARY<28000)

This would provide a default of \$9750 in this particular field if nothing was entered. But if this default was replaced by an entered salary amount, the new data would only be accepted if it was greater than or equal to \$6000 and less than \$28,000. Similar defaults can be set with logical or character fields.

This may sound complex, but it isn't unless you choose to make it so. The program can function at a lower level as an efficient list manager without the necessity of knowing about, or understanding, Boolean and mathematical operators, but they are there if, and when, you need them.

Under the "options" menu you have several command selections. The top



two are "design & amend layout" and "enter & retrieve data".

The design command presents you with a standard screen layout that can be easily modified by cutting and pasting sections, using much the same lasso techniques as MacPaint. Once the input screens are completed you can use the enter & retrieve options to add data, or to select data already in the database.

Selecting either of these options brings forward another appropriate menu. The enter & retrieve sub-menu, for instance, allows you to "search" the database, perform "multiple updates" or "multiple deletes".

Using multiple update, you can increase the cost price of all items from one particular supplier by whatever percentage you require, or reset opening and closing balances in an accounting file.

The search format screen gives up to 50 lines (the screen shows only eight) for defining search requirements — a slight case of overkill!

You could set up a search with the lines:

Each line is linked by (an assumed)

SEX	=	MALE
AGE	=>	25
SALARY	=>	10000
SALARY	<=	20000

logical AND — that is, the conditions of the first line AND the conditions of the second AND the conditions of the third, etc.

You apply all arithmetical operators in the form of field and condition statements, while the other necessary Booleans are there to be selected by the mouse. You can also define "calculated" figures as comparisons.

There is nothing difficult about all this. If you haven't handled these operators before in a computer program, they are something you will get used to in a very short time. The system is intrinsically logical. You can set up these search formats and save them for future use, so you don't have to re-invent the wheel each time. The sort and printing options are also pretty extensive. The program prints on a what-you-see-is-what-you-get basis.

There are some interesting options in the sort menu. If you select "sub-totals",

the report will produce calculated sub-totals whenever a nominated field changes. For instance you can nominate a field DEPT as the sub-total trigger, and whenever the name of the department changes, a sub-total is produced.

As you can gather from the relatively enthusiastic review, I like Omnis 2 very much. It is easy to learn and easy to operate, and yet it has a surprising level of complexity and sophistication below the surface. I await arrival of Omnis 3 with interest, but I wouldn't put off buying this current package if it was adequate for my needs. ■

FACT FILE

Product: Omnis 2

Price: \$415

Requirements: 512K Macintosh with second disk drive

Documentation: Skimpy but adequate

Skill level: Novice to intermediate

Supplier: Software Corporation of Aust, (03) 347 7011

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Bob Rickard (left)
and Bruce Bond:
upstaged the pros

Doing it better on a PC

Two insurance clerks who pitted their \$700 home computer against a multi-million-dollar mainframe have come up winners.

Bob Rickard and Bruce Bond are not your average clerks. For one thing, most clerks don't tell their boss a computer program could do their job better, and then reject a corporate decision that shelved their idea because it would take immense amounts of money and programming time. Not only did they

By Peter Young

Two insurance clerks wouldn't take no for an answer

reject the decision, they did the work themselves in a few months on a home computer after teaching themselves Basic.

As clerks with the insurance colossus AMP, Rickard, 40, and Bond, 28, were working in an area dealing with policy changes. They relied heavily on manuals bursting with data tables and reams of manual calculations that seemed to stretch back to the middle ages.

Neither of them owned a computer, but they were certain the job was tailor-made for one. They saw it saving hours of overtime for the company and weeks of waiting for customers. The trouble

was they couldn't convince the people who mattered. Corporate headquarters in Sydney — a city that also houses AMP's twin IBM 3084Q mainframes — simply tossed the idea in the too-hard basket.

Its verdict was that the idea had merit but would be too difficult for the company to attempt at that time. To be precise, according to Sydney, it needed a \$100,000 feasibility study and three man-years of programming effort. Adding insult to injury, they were told that branch personnel would not be qualified to do the work.

It was the wrong thing to say to Rickard and Bond. They scraped together a rickety tape recorder, a TV set bound for the tip, and a Tandy home computer. Rickard learned Basic and they sat down to do the job themselves in their spare time.

The result was a 300-line program. Instead of \$100,000 and three man-years of effort, it cost \$700 (for the Tandy) and took six man-weeks of full-time programming.

When they showed their boss what it could do, two things happened. They won the largest incentive bonus AMP has ever paid, and they stopped being clerks. Rickard was promoted to head a new Brisbane computer support section and Bond was made second in command.

"I didn't like taking no for an answer," Bob Rickard says in retrospect. As an inquiry clerk, he was frustrated by the weeks of delay in replying to customers who wanted to change their policies.

Bond, 28, was one of the clerks responsible for working out the complex calculations that showed how the changes would affect a policy. It was a mind-numbing job just to tell a policyholder what would happen to his return

if he changed his life insurance policy to a retirement payout.

The complex calculations were done with pencil and paper and relied on tedious consultations with stacks of printed tables. Then everything had to be done again by another clerk as an independent check. In Brisbane alone, it meant six clerks piling up overtime just to handle six or seven inquiries a day.

To Bob Rickard, it seemed a computer program was the obvious answer. He'd once taught himself IBM's RPG I — a language much like Basic — from a textbook. He says that when his suggestion was dismissed by Sydney, "we decided we'd do the feasibility study ourselves".

"We spent three weeks of full-time work spread over six months, doing bits at weekends and late at night. By the end, my wife, Rhonda, was getting pretty fed up with Bruce and me messing around with this toy computer until all hours."

There were a few false starts, like the time their program had a policyholder paying the company \$500,000 for the privilege of dying. But when they finally took it in to demonstrate to management, the effects were spectacular. "Their eyes popped out of their heads. Here was something being done in 10 seconds that they were used to seeing occupy overtime hours," Rickard says.

The good news for AMP doesn't stop there. The program can churn out 45 variations of any change. It means customers who previously had to wait three weeks for a single adjustment can get overnight answers to a whole set of options.

That alone has drummed up new business for AMP, according to Brisbane branch manager Bev Hodgson.

"What's happened since they put in their program is that a new interest in changing policies from one type to another has developed in the marketplace," he says.

The new system — now installed on AMP's main computer network — is conservatively estimated to save \$100,000 a year for AMP. It has earned Rickard and Bond a \$12,000 incentive award, as well as their new jobs overseeing the introduction of IBM PC systems to the Queensland sales force.

The company says it has no reason to be red-faced about how two amateurs put together a program the professionals said was too hard. Ken Harrison, in charge of AMP's computer applications development division in Sydney, says his 150-strong staff is blameless. "This suggestion would have come down to the appropriate business area in head office, I would have thought. They would have decided that, given their priorities, they weren't even able to refer it to us to do any work."

AMP's Queensland data processing manager, Peter Henderson, thinks the saga illustrates an old rule. "It's a classic case of the rule that 20 percent of the system takes 80 percent of the work," he says.

"We put the suggestion up as a simple system to do the bulk of the hackwork. Our intention was something that would handle 80 percent of the cases, and we'd still do the rest manually. Sydney took the approach that went for the ultimate system that would do 100 percent of the work."

Whatever else they might have done, Rickard and Bond have made one thing clear. Even with a mega-dollar mainframe on your side, it never pays to say no to an amateur with a home computer and a bright idea. ■

Switching printers

WIZARD'S NOTEBOOK

I have often been asked by those with two printers attached to their PC how to redirect the output from various programs to the second printer. Some programs recognise a PC's ability to support more than one printer, but many, including PC DOS itself, do not.

I was forced to come up with an answer after purchasing a second printer myself. An extensive hunt through back issues of various magazines turned up an article called *The Greater Printer Swap* by John Dickinson in the March 5 edition of *PC Magazine* (Volume 4, Number 5).

This article describes a simple program, LPTPORT, which lets you switch

between high-speed draft and letter-quality printers. If you have PC DOS Version 2.0 or higher, LPTPORT.COM can be easily entered using the DEBUG assembler. Figure 1 is a DEBUG session that shows you everything you have to do. Just make sure you have a copy of DEBUG in the default drive, and type DEBUG. (You can enter everything in lower case.)

Once in DEBUG, type A (for Assembler) and enter the assembly language mnemonics (commands) as you see them in Figure 1. When you have finished enter a second carriage return. Then load the CX register using the R CX command (at the prompt enter a 14). Name the program with the N command, then write the file using the W command. To get your PC to switch printer ports when using an internal print spooler, run LPTPORT before the spooler is loaded.

FIGURE 1

```
A>debug
-a
1EFF:0100 mov ax,0040
1EFF:0103 mov ds,ax
1EFF:0105 mov ax,[0008]
1EFF:0108 mov bx,[000a]
1EFF:010C mov [0008],bx
1EFF:0110 mov [000a],ax
1EFF:0113 ret
1EFF:0114
-n lptport.com
-r cx
CX 0000
:14
-w
Writing 0014 bytes
-q
A>
The DEBUG assembler can be used
to create LPTPORT.COM
```



While on the subject of redirecting printer output, another commonly asked question is how to redirect printer output to a file instead of the printer. The solution is to use the utility FSPool (available on disk from the Melbourne PC User Group, or it can be downloaded from the PC Connection bulletin board (03) 528 3750).

Following on from last month on the effective use of subdirectories, here is a relatively simple way of using menu macros to choose subdirectories from Lotus 1-2-3 at the touch of a key. This is a great idea for those with hard disks who keep different 1-2-3 files in different subdirectories.

If the file containing the menu macros is called AUTO123.WKS, and it is stored in the 1-2-3 default directory, and the initial macro is \0 (backslash zero), you get a menu of options as soon as you enter 1-2-3. In this case cell C1 is given the range name \0. Column A has been set to a width of 72, so any text you may want displayed on the initial screen can be easily centred.

Figure 3 contains the complete macro, suitably embellished with explanations (column B). The long prompts have been shortened to fit, but they can be as long as will fit on the second row of the menu.

The first menu, called "MENU" and starting at C8, lets you select the disk or subdirectory. The macro then changes 1-2-3's default directory according to the menu selection, and passes control to the second menu. The second menu, called "NEWOLD" and starting at C16, asks if you want to retrieve an existing file or create a new one.

Note that the first menu has options that allow the user to specify any subdirectory, or exit 1-2-3. The second menu allows the user to return to the first menu. Since 1-2-3 menus allow no more than eight choices, this macro lets you choose from only eight subdirectories. But if you name the last menu selection "More", you can use it to call up another menu of subdirectories.

A similar menu macro was described by Rick Vosik in the June 25 edition of *PC Magazine* (Volume 4 Number 13), which led me to think about documenting this version I developed more than a year ago.

Wizard's Notebook is a regular feature in *Today's Computers* in which Lloyd Borrett will pass on tips for PC users. Naturally, you are invited to contribute tips on software, hardware and documentation. Address letters to Wizard's Notebook, *Today's Computers*, 392 Little Collins Street, Melbourne, 3000. Please include your telephone number, which will not be published, so we may call to verify letters.

FIGURE 2

	B	C	D	E	F	G	H
1	Macro \0 ----->	/xmMENU~					
2	Calls up the menu						
3	called "MENU" in						
4	range C8 to G12.						
5							
6							
7	MENU:						
8	Short prompt ----->	A:	Sales	Admin	Select	Quit	
9	Long prompt ----->	Floppy	EXPLANATION	EXPLANATION	Specify DIR	End 1-2-3 Session	
10	File directory command -->	/fd	/fd	/fd	/fd	/qy	
11	Name of directory ----->	a:\	c:\sales	c:\admin	{?}		
12	Call NEWOLD menu ----->	~/xmNEWOLD~	~/xmNEWOLD~	~/xmNEWOLD~	~/xmNEWOLD~		
13							
14							
15	NEWOLD:						
16	Short prompt ----->	Old	New	Previous Menu			
17	Long prompt ----->	Old worksheet	New worksheet	Reselect			
18	Take action ----->	/fr	/wey	/xmMENU~			
19	File Retrieve						
20	or Worksheet Erase Yes						

The News

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PC AUSTRALIA

Risky business

By Lloyd Borrett

How many spreadsheet solutions have you developed? Are you happy with them? Are you sure the results they produce are correct? Of course, you would gladly swap solutions with anyone else because they surely take the same precautions you do. After all, everyone carefully checks their spreadsheet solutions, documents the method used, and records all changes made. You do all that, don't you?

The acceptance of personal computers in business has been largely due to the benefits gained by using spreadsheet programs. VisiCalc, Lotus 1-2-3 and other spreadsheet programs allow executives to bang out models and forecasts simply and quickly. But how many have stopped and considered the potential for errors?

Dan Bricklin, chairman of Software Arts, was one of the two designers of VisiCalc, the spreadsheet program that started it all. "Just as dial telephones turned us all into telephone operators, VisiCalc turned businessmen into computer programmers," he says.

What? A spreadsheet solution is a programming language? And businessmen are computer programmers? Yes indeed. If you have been using a spreadsheet program, then you have been doing computer programming.

With literally thousands of programming languages available today, computer scientists have established criteria for what makes a good programming language and what makes a bad one. By any of these criteria, the spreadsheet is a poor programming language.

The real danger is that the new breed of non-technical users of personal computers does not even seem to be aware of this. When a problem is being solved with a spreadsheet program, most pay less attention to checking than they would if solving the problem by hand. Spreadsheet users often ignore even such standard accounting procedures as "hash-totalling" — adding up all the

figures across a spreadsheet row to see if they agree with vertical column totals.

Most spreadsheet solutions produced by the typical business user are classic examples of everything that could be wrong with a computer program. The code is difficult to understand. How do you know that reference to cell E15 shouldn't be W15? Maybe that plus sign should be a minus sign. Who knows?

That is the problem; in most cases no one does. Studies have shown that poor programming languages are far more "error prone" than good ones. The probability of a programming error in a spreadsheet solution is perhaps a hundred times as great as it would be if the same solution were written using a structured programming language.

Even if you have checked the spreadsheet results, the chances are that your solution isn't documented properly. Sure, you can understand it all now — but what about in six months? God help the company if you should leave, or get run over by a bus.

When you create a spreadsheet for your own use — to help balance the cheque book, for example — it is one thing. But more and more financial models stored on a company's disks are shared among many users, and a single mistake may affect decisions made in many different sections of the company.

The reason all those data processing department backlogs exist is because professional programmers spend most of their time designing the solution, building in safeguards, documenting the methods used, and testing the result.

Yes, you can jump the queue by becoming a programmer and using a spreadsheet program to produce a solution. But think for a moment about the problems you would expect if the data processing boffins were to start doing your job. Should it not be the same now that you are undertaking to do their job? ■

Lloyd Borrett is support co-ordinator for HiSoft Australia, president of the Australian PC User Association, founder of the Melbourne PC User Group, and system operator of the PC Connection bulletin board.

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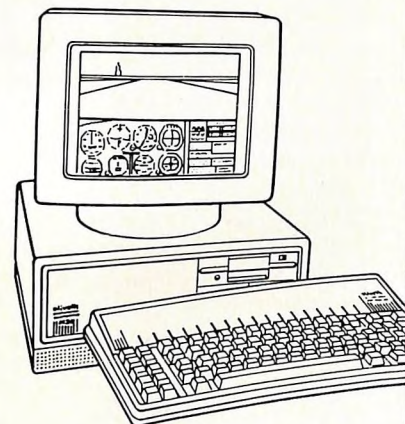
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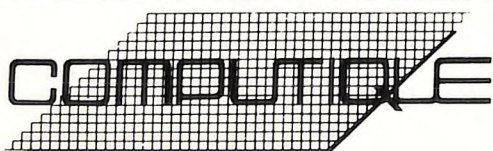
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Headers and footers

Question: I am using Lotus 1-2-3 and wish to place a date at the top and a page number at the bottom of my printouts. Can this be done automatically?

Answer: This can be easily accomplished in Lotus 1-2-3 as follows: to get the date or page number at the foot of the page you should issue the commands/Print Printer Options Footer (or Header if you want to insert the date or page number at the top of the page). Then you type in the required footer. The variables that are available to you are @ and #.

The @ sign will cause Lotus 1-2-3 to automatically insert the date. For greater flexibility you can enter text before or after the @ sign. For example, typing in "Date:@ " will cause the date to be printed as Date:24-July-85. The # sign will cause Lotus 1-2-3 to automatically insert the page number. You can enter text in front of or following the # sign. For example, typing in "Page Number:# " will cause the page number to be printed as Page Number:1, etc.

You can also insert the date and time plus other text on the same line (either header or footer). This can be accomplished by separating the variables by the vertical pipe symbol (the vertical broken bar character above the back slash on most PC keyboards). To have the date, your company name and the page number printed on the one line, the following should be entered as the footer or header: Date:@ ACME TRADING COMPANY Page Number:#

Symphony users also have this facility available. To enter a header or a footer you should follow the commands: F9 Print Settings Page and Footer or Header.

Question: I am experimenting with macros in Lotus 1-2-3 and am having trouble debugging them when they don't work (which is a great deal of the time at the moment). Is there any simple way to test a macro? I am thinking of upgrading to Symphony shortly; are there any better facilities for debugging macros in Symphony?

Answer: During the design and testing



LOTUS TALK
by Barry Roberts

of macros, you will almost always notice that Lotus 1-2-3 is too fast for you to detect errors. To help you diagnose problems in your procedures, Lotus 1-2-3 has a single-step mode in which it pauses after each keystroke of a macro.

To access this facility you should first hold down the Alt key and then press the Help key, before activating the macro. Once you activate the macro a STEP light will appear at the bottom of the screen and you can process the macro by pressing any other key (the space bar is easiest). The macro will execute one step at a time and will process the next step only when a key is pressed. Debugging the macro is then a simple matter of noting when the problem arises.

As you are probably aware, 1-2-3 will let you know when a problem occurs by BEEPING at you. To turn off the STEP indicator you should press the Alt-Help combination again. Symphony users can achieve the same results by using the Alt and F7 keys.

As you are contemplating an upgrade to Symphony, you should be aware of a potential problem with macros created in 1-2-3. Due to the different menu

structures of 1-2-3 and Symphony, 1-2-3 macros will not operate in Symphony. To overcome this problem, Lotus has created a macro conversion utility. This utility does not convert all macros, but it is a simple task to edit those that are not convertible. Although the utility does convert most macros, it does not modify them to take advantage of the more powerful Symphony macro language.

Question: I am using Multiplan and wish to upgrade to Lotus 1-2-3 to take advantages of the in-built graphics and database facilities. Is there any easy way to convert my Multiplan files into Lotus 1-2-3 format?

Answer: There is a utility available for this called Convertacalc, which enables you to convert to and from the following spreadsheet formats: Symphony, Multiplan, Supercalc, Visicalc and 1-2-3.

Question: I quite often run out of memory using Symphony, which is quite annoying as I then have to reduce the size of my model by placing some of the calculations in another worksheet. Symphony warns me of a pending full memory with a MEM sign at the bottom of the screen when I am within 5 percent of the available memory; this is usually the first sign of a problem. Is there an easier way of telling how much memory is available before the MEM sign shows?

Answer: If you press the F9 services key and then select the Settings option, Symphony will display the memory still available to you as well as the maximum memory available at the start of the session. A similar facility is available in Lotus 1-2-3 by pressing/Worksheet Status.

Barry Roberts is the national newsletter editor for the Australasian Lotus Users Association. He also manages Practical Software, whose activities include specialist training in products such as 1-2-3 and Symphony, as well as applications development using 1-2-3, Symphony and dBase III. Barry can be contacted on (03) 267 4357, or send your questions to him at Today's Computers, 392 Little Collins Street, Melbourne 3000.

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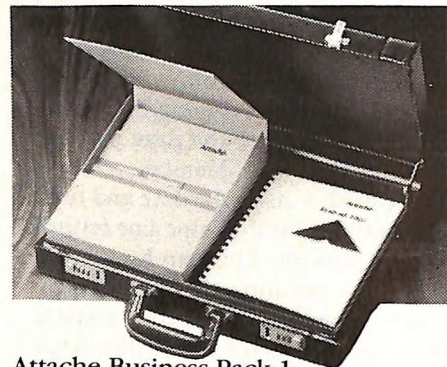


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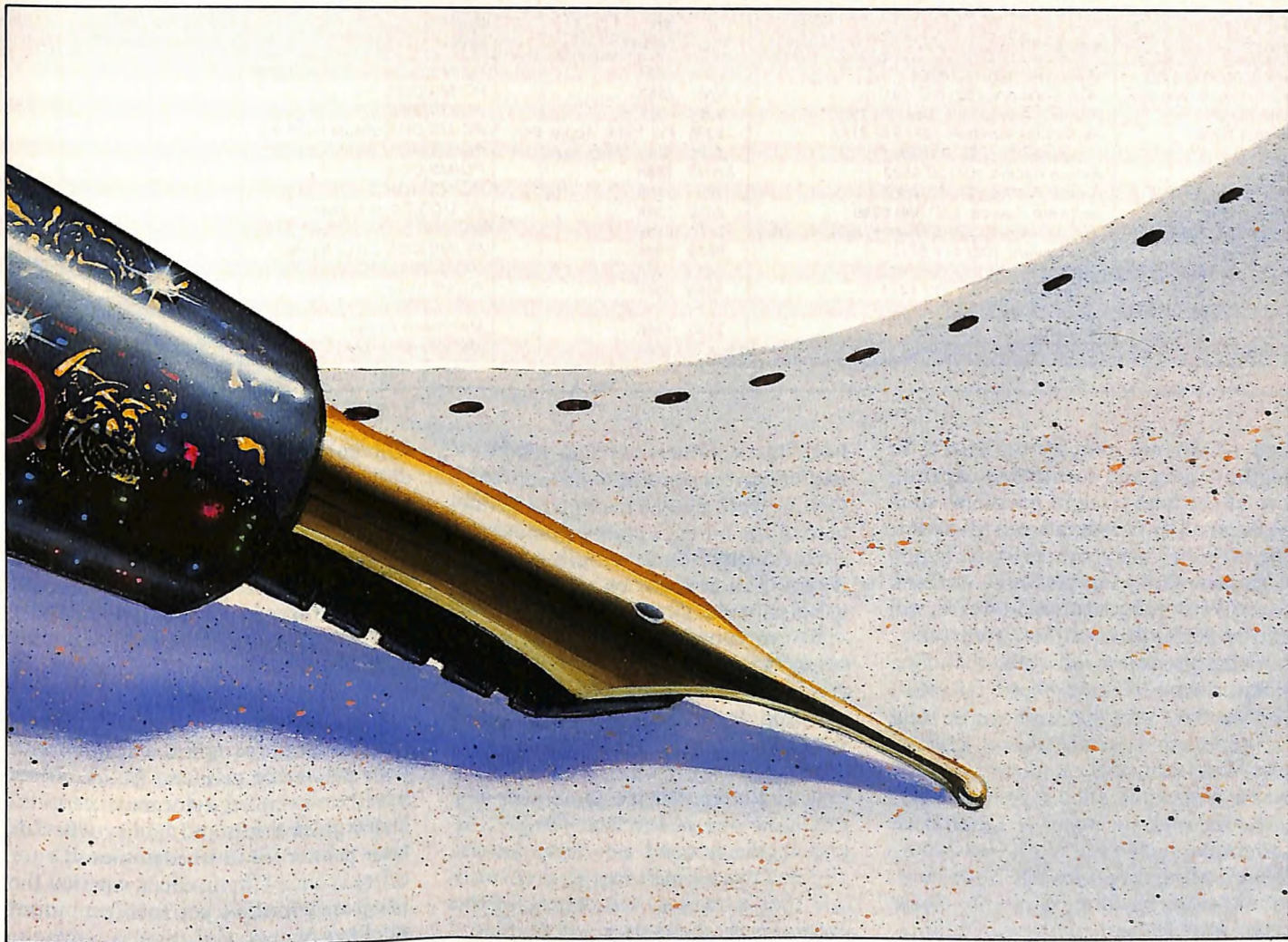
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A word for all reasons

By Gary Ross

The word processor has been as revolutionary in its impact as the ball-point pen. Just as the ball-point freed us from the tyranny of running ink and smudges, so the word processor has freed us from the tyranny of the page.

Made a mistake? No problem. Just zip back and fix it. Transposed two letters? Easy. Just a few strokes of the backspace key and the slate is wiped clean. They are to the pen what cars are to horses.

And they are as varied as cars in price, capacity and style. For example, WordStar and its new stablemate, WordStar 2000, use control keys for all functions. The argument is that a skilled typist can drive them without having to move the hands from the home position. By contrast, a number of programs,

Word processors vary widely, but here are some tips to help you make a decision

including Samna, use a combination of the cursor keys and the programmable function keys. Others, such as Perfect Writer and Microsoft Word, use a key as a command key. Striking it brings up a menu of commands.

They also vary widely in their abilities. At one end of the scale, we have simple word processors like pfs:Write, while at the other we have heavyweights like

Wordcraft with its built-in communications and dictionary.

What follows is an overview of the major packages in which we summarise their strengths and weaknesses. It is not possible to provide a pointer as to which is the "best" processor. It's like asking which is the best car on the road. Best for what? It all depends on your requirements. However, here are a few tips to help you narrow down the field.

For someone who needs to use a word processor only occasionally, a menu-driven system is probably preferable. Those who spend lots of time at the keyboard will probably be happier with command-based programs or those that make extensive use of the function keys. But that alone is not enough on which to base a selection.

Some people mainly create drafts,

WORD PROCESSING

Product	Supplier	Price	Min memory	Operating system	Disk drives needed	On screen formatting	Makes backups
Microsoft Word 2.0	Microsoft, (02) 452 5088	\$595	256K	PC/MS DOS Ver 2.0 or higher	2	*	*
Multimate Advantage	SCA Software, (03) 663 6011	N/A	256K	PC/MS DOS	2	*	*
New Word	Archive Computers, (03) 699 8377	\$395	96K	PC/MS DOS	1	*	*
Perfect Writer	Perfect Information, (02) 332 2177	\$395	Pc: 128K; Apple: 64K	PC/MS DOS, Apple DOS 3.3	2	*	*
pfs:Write	Imagineering, (02) 212 1411	\$195	IBM: 128K; Apple: 64K	PC/MS DOS, Apple DOS 3.3	1	*	*
Samna +	Arcom Pacific, (07) 52 9522	\$1095	384K	PC/MS DOS	2	*	*
Samna Word III	Arcom Pacific, (07) 52 9522	\$850	256K	PC/MS DOS	2	*	*
Spellbinder	Software Source, (02) 389 6388	\$659	128K	PC DOS 2.0 or higher	1	*	*
Wordcraft	Personal Computer Software, (02) 923 2899	\$750	256K	MS DOS 2.0 or higher	2	*	*
WordPerfect	Sourceware, (02) 411 5711	\$639	192K	PC/MS DOS 2.0 or higher	2	*	*
WordStar	Imagineering, (02) 212 1411	\$445	96K	CP/M-80-86, PC/MS DOS	1	*	*
WordStar 2000	Imagineering, (02) 212 1411	\$645	256K	PC/MS DOS	2	*	*
Macintosh Software							
Microsoft Word	Microsoft, (02) 452 5088	\$365	128K	Macintosh Finder	1	*	*
MacWrite	Apple Computer, (02) 888 5888	Bundled	128K	Macintosh Finder	1	*	*

and so do not require the extensive mail-merging and formatting capabilities of the heavyweight programs such as Samna III, Wordcraft and Microsoft Word. They may be perfectly happy with something like pfs:Write or Bank Street Writer, Secretaries, however, will almost certainly need those functions.

Other programs offer other benefits. For example, Samna Word III offers rudimentary graphics and can be used to generate organisational charts. pfs:Write, although a fairly low-level word processor, allows you to insert graphics into the text. A number of programs, including WordStar 2000+, Wordcraft and Samna III+ have communications facilities built in. These three also feature maths capabilities, Samna actually providing a seamlessly integrated spreadsheet.

A number of programs are also designed to a house "style". Thus users of Microsoft Word will immediately discover its similarities to Multiplan and Chart. The same is true of the Perfect series and the pfs suite of software.

Which one you want will depend on your requirements. But don't base your judgment on capabilities alone. Word processors are a very personal tool, especially to those who use them a lot. The "feel" of a package is just as important when buying a word processor as it is when buying a car. You might prefer Wordstar 2000's use of control keys to use of the number pad. Then again, you might prefer Microsoft Word's ability to work with a mouse.

The value of mice in word processing is still a hotly debated topic. Some argue that they are ineffective because you have to keep moving the hands from the keyboard to the mouse and

back again. Others say that it's just a matter of reorganising your approach to your work to take maximum advantage of the mouse's ability to move the cursor swiftly from location to location. Again it all depends on what you feel happiest with.

Before you start choosing, carefully assess your needs. If you're an academic, or write detailed reports, you will probably want auto-numbering and auto-footnoting. If the budget is low, you will probably want to have a close look at Perfect Writer. Otherwise you will need one of the heavyweights. If you regularly send out form letters, you will need a mail-merge, preferably one that is easy to use. Many of the programs on the market will do that.

Don't be satisfied with just a self-running demonstration. Insist on plenty of hands-on time. If you tend to have a large staff turnover, ease of training will be particularly important. Does the program have a self-running tutorial? Samna and Perfect Writer do, to name just two.

The speed with which software works is another factor. Some programs, such as WordStar, keep portions of the program on disk and load them into memory as required. These programs often spool the file to disk too, allowing very large documents but slowing down work. Others do everything in memory.

Consider also whether the program needs a hard disk to run smoothly. Some programs, such as WordStar 2000, can involve a large number of disks, with some disk swapping. If you do not have a hard disk, insist that the demonstration be run entirely from floppies, or you will get a false impression. If you plan on running the program from a hard disk, check to see whether it

will handle DOS sub-directories or different CP/M user numbers.

Test the help facilities. If you can perform a complex operation like a mail-merge just from the help messages alone, or if the program guides you through the process so smoothly that you can work everything out for yourself, then other users will probably have few problems.

If you can test on your own premises, ensure that the program will work with your printer or printers. Many offices have two printers, a dot matrix or ink-jet for quick drafts and a daisy-wheel or laser printer for finished copies. If your office is one of these, check whether the program will allow you to direct output to either one.

Finally, be prepared to take your time. People's needs vary greatly. Because of this, word processors frequently encompass a wide range of abilities and features. Very few people would use all the features of a major program such as Samna, Wordcraft or Word. But there will be many who will be cursing the lack of the very feature they need to get the job done.

Samna Word III and Samna Plus

Samna Word III claims to be the first PC-based word processor to duplicate all the functions of a dedicated word processor. It is certainly one of the most powerful and feature-laden.

One of these features is floating footnotes. Samna can take up to 300 of them, and when you move the reference, an attached footnote will move with it to its new location. Samna prints footnotes on the same page as the reference.

Samna redefines the number pad, turning it into a dedicated keyboard.

WORD PROCESSING

Menu driven	Multi-file editing	Dictionary	Mail merge	Sort capability	Decimal tab	Maths	Auto indexing	Chain printing	Footnotes	Accepts ASCII	Create ASCII
*	*	*	*	*	*	*	*	*	*	*	*
*	*	*	*	*	*	*	*	*	*	*	*
*	*	*	*	*	*	*	*	*	*	*	*
*	*	*	Opt	Opt	*	*	*	*	*	*	*
*	*	Opt	Opt	Opt	*	*	*	*	*	*	*
*	*	*	*	*	*	*	*	*	*	*	*
*	*	*	*	*	*	*	*	*	*	*	*
*	*	*	*	*	*	*	*	*	*	*	*
*	*	*	*	Opt	*	*	*	*	*	*	*
*	*	Opt	Opt	*	*	*	*	*	*	*	*
*	*	*	*	*	*	*	*	*	*	*	*
*	*	***	*	*	*	*	*	*	*	*	*
*	*	***	*	*	*	*	*	*	*	*	*

***Uses Hayden Speller

Using the keys you can move forward by the character, word, line, sentence, paragraph or file. Hit the same key with the shift key down and you go the other way. You get keyboard stick-on labels and contextual on-line aid to help you get organised. The function keys handle underlining, printing, justifying, formatting bold and capitalisation.

Samna lets you format paragraphs individually and preserves the format when you move the paragraph somewhere else. It can also search the disk for text, a very useful feature where records are kept in conjunction with a word processor.

There are a calculator, direct typing from keyboard to printer for those annoying one-off jobs, windows to let you view two parts of a document or two different documents, and even a zoom facility that displays your page in miniature so you can really see what your finished document will look like.

An unusual feature is line drawing. Samna can be used to draw up organisational charts and can enclose text in boxes. Another unusual touch is its ability to display an overview of the document so that you can see what the entire page will look like when printed.

An 80,000-word copy of the Mirium-Webster dictionary is included — there is now an English dictionary — and the user can create a personal dictionary of 10,000 words. Other features include up to 17 levels of superscripts and subscripts — very useful for technical writers — and the ability to embed typesetting codes into the text. The Samna manual was created and set out using the product alone.

Samna Plus also includes a spreadsheet which integrates seamlessly into the word processor. Just insert the

numbers or the formulas, and the numbers will appear in the document and be printed as though they are part of that document.

Samna Plus is one of the true heavyweights of the word-processing world, which helps explain why it needs a hefty 384K of memory. It is a tool for professionals, and will probably deliver more word-processing power to its users than most will be able to exploit.

Wordcraft

Wordcraft is another of the heavyweights. It comes with a disk-based tutorial and extensive documentation, including a quick reference guide. In the early days, you will need that.

It is extensive and uses the Control, Alt and programmable function keys for different commands. The soft keys are used to access any one of six separate menus which appear in small boxes on the bottom of the screen. The escape key acts as a toggle between type and command modes. Commands include GET, REPLACE and run another program.

You can move the cursor by word, line, sentence or paragraph and go immediately to either end of the document. You can also delete by characters, words, to the end of a line, or by sentence. However, the program has been criticised for being a bit confusing to drive at first.

It is not quite a true "what you see is what you get" word processor. Underlining works all right, but italics and bold come up in reverse video.

It has a good English dictionary (rather than the American ones that turn up all too often). Although it doesn't suggest corrections, it does display what it finds is the spelling

closest to yours, and lets you scroll through its entries if you're not happy with its choice.

Standard paragraphs up to a page long can be stored and recalled as required. It handles proportional printing and does mail-merges.

The program has been designed to support a wide variety of printers and comes with a library of what are called .PDF files. If your printer isn't among them, you can create your own.

Wordcraft is one of the most powerful word processors around. Apart from a surprising inability to do automatic footnoting and assemble a table of contents, it will do almost anything the busy modern office could require.

WordStar

WordStar is the grand old man of the word-processing world. One of the first really powerful and comprehensive word processors to appear, it ruled the roost in the days when 8-bit CP/M systems were de rigueur. Since the advent of more powerful 16-bit systems such as the IBM PC, it has slipped in popularity, but is still among the best sellers.

WordStar is not an easy word processor to learn. It uses the control keys for almost everything and the layout is based more on the geography of the keyboard than on mnemonics — Ctrl K D is not a logical command for saving a file. Yet WordStar continues to sell well, and for a number of reasons.

The first is that the program is so ubiquitous that there is never any shortage of help, or other users.

Then there's the fact that it is undeniably powerful. It has full mail-merging facilities, and a host of commands for formatting the layout of the page. You can set top and bottom

WORD PROCESSING

margins, have automatic page numbering, insert headers and footers.

Automatic indexing is available as an optional extra, as is an excellent phonetic dictionary. It will show you the correct spelling of "fantom", but does not know suffixes.

Unfortunately WordStar is getting a bit long in the tooth and is being superseded by newer, more powerful packages. Nevertheless, there are good reasons for promoting the program. Firstly, it is good value for money. At \$445, it is a lot of word processor for the money. Training is readily available from any number of sources, and if the office has a lot of old computer hands on board, WordStar is sure to be in private use somewhere.

Finally, WordStar is something of an industry standard, and there is a lot to be said for standards. A number of widely used programs use the same keyboard layout as WordStar, so the effort of learning the program is rewarded with easier adoption of other programs. dBase II inherited its cursor commands from WordStar, and so does the notepad in Sidekick.

Microsoft Word

Microsoft Word is a rare beast — it is one of the few word processors that can be called a true "what you see is what you get" unit. Many word processors require the insertion of control codes into the text, and these in turn often throw things out of whack. The user has to accept that things will turn out right in the end.

Not so with Word. If you have a graphics card, you see the text exactly as it will appear on the printed page. Bold words appear in bold and italics in italics.

It is also one of the few to support a mouse. In the case of Word, the mouse makes it quick and easy to work with the multiple, dynamically adjustable windows, and to scroll rapidly through the copy, marking words for deletion, reformatting them or moving them, perhaps even to another file.

Its editing features enable you to undo the effect of your last action, and handle footnotes and chaptering. The display is updated continually and the text remains neatly aligned no matter what you do.

The mail-merge facilities will accept input from ASCII files and can even do

a spreadsheet-like conditional test to decide which of two different messages to insert into the document.

On the other hand, it is no speed demon, and users can get ahead of the program. File saving times are also reported to be sluggish.

The program fits on one disk, which saves disk-swapping and leaves a second drive free for your data files. The program operates in the Microsoft "house" style, with a window at the top

One of Word's most powerful features is its multiple window capacity

and all the status information and menu items at the bottom of the screen.

To issue a command, you first select a section of your work, the program showing you what you have selected by highlighting it in reverse video. You then go into command mode by hitting the escape key. After you select a menu option, the program displays the sub-menus underneath, leading you through the various steps.

There are so many formatting commands available that it should be possible to handle virtually any contingency. It's very easy, but not as quick as some of the more complex — but harder to learn — command-driven arrangements.

One of Word's most powerful features is its multiple window capacity. You can have up to eight files displayed on the screen at one time, each in its own dynamically resizeable window, and move text freely from one to another.

You can also keep a glossary of frequently-used words, and simply use the Copy command to insert the word into your main text. You can also maintain a library of what Word calls "style sheets". You select an area of text, or the whole document, call up a style sheet, and make it all conform to the selection.

Word supports a wide range of printers including Epson, NEC, HP Thinkjet and Diablo, which means it will also run a large range of compatible printers. You also get a library of generic fonts such as Prestige and Pica,

not to mention Hebrew, Greek and Russian. If your printer can handle it, they will print correctly, proportionally spaced, and in the selected point size. You can even run two printers.

All in all, Microsoft Word is a powerful word-processor that has won many friends thanks to its logical organisation, ease of use and many powerful features. And for some, the mouse is just further icing on the cake. Microsoft has now released the long-awaited Version 2.0 of Word, unfortunately too late for inclusion in this roundup. We look forward to seeing it.

Perfect Writer

Perfect Writer is the poor man's Samna. For a price tag of about \$350, you get a word processor with such refined features as auto-indexing, auto-numbering, the ability to keep multiple files in memory for fast access, limited windowing capabilities, a dictionary and a thesaurus. Another \$200 gets you a full database package that integrates with Writer to give you mail-merging facilities.

Perfect is not a full "what you see is what you get" word processor. For example, to put a block of text into bold you have to insert the instruction and enclose the required text within braces, (the { and } characters). This of course pushes everything out of whack, but you can use a feature called Preview to see what your page will really look like when it's printed.

On the other hand, Perfect is fast and easy to use. Hit the Escape key and a menu window pops up, so positioned that it will not conceal the area you are working on. This leads into a clearly labelled tree of sub-menus.

The programmable function keys are used to move the cursor about the keyboard, and you can also use commands to move the cursor by word, sentence, paragraph and to both ends of the file.

The range of functions is out of all proportion to the price tag. The thesaurus will be much appreciated by creative writers (even as they gripe about the on-screen formatting codes) and the dictionary is comprehensive with a full library of prefixes and suffixes. There's also auto-indexing, auto-paragraph numbering and auto-indexing. It even does automatic saves,

Continued page 107

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WORD PROCESSING

Dedicated hangers-on

Over-eager supporters of the personal computer have been predicting the death of dedicated word processing for several years. They have not yet been proved right; dedicated systems have hung on against the onslaught of the PC from one side, and increasingly sophisticated electronic typewriters from another. But word processors have changed dramatically in response to these challenges.

Industry sources estimate that sales of single-purpose stand-alone word processors amounted to no more than 5000 units last year. They believe the market for those products is static. But over the past year, suppliers of word processing systems have opened up a new market for lower-cost, multi-function, integrated secretarial workstations.

These new machines, which fall between the older style word processors

By John Kavanagh

and PCs, are selling in the \$5000 range, which reflects the impact PCs have had on this market. They offer full CP/M or MS DOS functionality but usually have limited RAM and storage in standard models. They are special purpose personal computers.

These products are coming from Wang, Olivetti, IBM, Remington (NBI), CPT and Wordplex. Their strength lies in the fact that their word-processing functions are easier, smarter and quicker than anything on a PC. The suppliers are confident that enough companies want a good word processor and will take one of these products in preference to a more versatile PC.

A recent Yankee Group office automation survey supports this marketing

philosophy. According to Yankee's figures, two-thirds of business managers believe that dedicated word processing is a thing of the past. But the survey shows that word processing is still the most important office automation function.

Eighty-two per cent of respondents said they believed multi-function workstations were the way to go. As the market moves in this direction, WP companies will have to compete with office automation offerings from a staggering number of hardware manufacturers.

Wang is the supplier with the highest profile in this market. It boasts that since 1979 it has offered WP and more on all its products. The company's current secretarial offerings include the Wang Office Assistant and the two-year-old OIS 4360.

Wang's national marketing manager,

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WORD PROCESSING

Cliff Smith, describes the company's approach as "integrated information processing". The Office Assistant, which is primarily a stand-alone machine, offers 256K RAM, single floppy, a multi-tasking operating system and a 20cps printer in its \$4950 package. The workstations can be networked and would operate in a typical cluster of four.

Word processing is still the most important office automation function

Francis Vella, Olivetti's product marketing manager (ETS systems), believes that secretaries have not reached the point where they need to use PCs: they will use spreadsheets to help compile their bosses' reports and they will use databases for mailers, stock lists and so on; but their main keyboard work is word processing.

This thinking has gone into the development of Olivetti's ETS 2000 range. As stand-alones the ETS 2005S (single floppy) and ETS 2010S (dual floppy) offer CP/M and MS DOS and can be upgraded to a 10-megabyte hard disk. The Access package running on these models incorporates a window function so that users can merge data and WP files. As a cluster system these workstations are grouped into Olivetti's IOS 2040 — a network joining up to 15 clusters, with a shared printer, storage from 18Mb up to 120Mb and supporting a mix of workstations including Olivetti's PC, the M 24.

Olivetti is also making a strong push in the lower end of this market with its ETV 240 and ETV 250 video typewriters. These "glass typewriters" provide an entry point for users of electronic typewriters to move up to basic word processing.

Last December IBM announced its Office Systems Family, a series of programs with complementary functions, including additions to the DisplayWrite text processing system, that can be used on the IBM PC, the System 36 and the System 370. The office programs provide full text processing and editing, library services and electronic document distribution.

The Office Systems Family programs allow information exchange in networks of PC, System 36 or System 370 users, as well as with other IBM systems. DisplayWrite 3 brings automatic footnoting, outlining and spelling correction to the existing functions of DisplayWrite 1 and 2.

IBM plans to give PC users access to the library and distribution services of its larger systems. This will effectively make the PC the intelligent workstation for IBM's continuing office automation.

Remington Pty Ltd has positioned its NBI office products range to operate within multi-vendor environments. With compatibility the prime requirement, NBI has introduced its clustered personal computer. The new workstation fits in with the NBI OASys64 shared resource system as well as running third-party PC software.

Conversely, NBI's word-processing software is now available on IBM's range of PCs. Remington claims it is the first mature software made available to a personal computer by a major word-processing vendor. The NBI system is MS DOS compatible and will integrate with third-party software.

Remington has also incorporated electronic mail into the NBI OASys 64, using a cluster controller that connects NBI's 2000 and 4100 personal computers as well as the IBM PC.

Wordplex offers the Corona, a PC compatible, the Convergent Technologies NGen multi-user micro system and its own Wordplex WP-based system, which now incorporates electronic mail and will support Unix later this year.

"WP is still the main office automation function," says Wordplex manager Graham Brown. "People are starting to ask about electronic mail now. Sales of our Wordplex WP systems were up last year and they will be up this year; but the market is changing and we have taken on the PC and the micro products in recognition of that. In the end it will come down to who offers the best service and support in this office automation market."

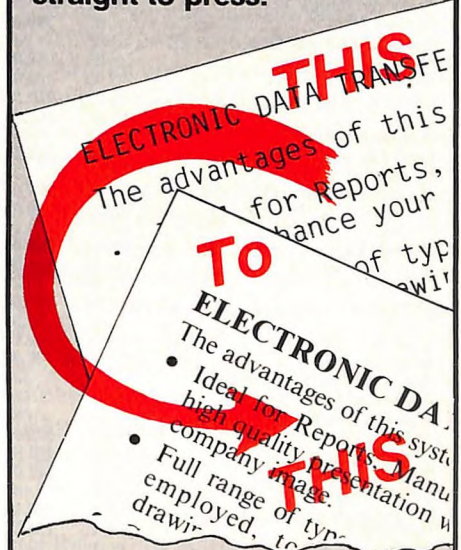
PCs have made things tough for the dedicated word processor, but they have not caused its demise. As the market moves away from stand-alone functions, the WP suppliers are coming up with their own multi-function and networking solutions. ■

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WORD PROCESSING

From page 102

waiting for you to pause for a second or so before doing so.

You can get full mail-merging facilities with the addition of Perfect Filer, but since all the programs in the Perfect series work with standard ASCII files, it is not too difficult to get other database programs to output in the appropriate format.

Compared with the heavyweights such as Samna and Wordcraft, Perfect is a bit rough around the edges, but it is very complete in its features and drives very nicely. For those on a low budget, Perfect is a very attractive proposition.

pfs:Write

pfs:Write is one of a family of low-priced, easy-to-use products and uses a house style which allows users of other pfs products to learn the program more easily.

The program has all the essentials: text movement and deletion of words, sentences, paragraphs and selected blocks. It has automatic word wrap, and carriage returns are displayed on screen.

The range of formats is limited but sufficient for most average needs. You can embolden and underline, and text can be set ragged right, justified (like this print), or flush right.

Text is moved by deleting it and then "pasting" it back in its desired new position. It reads and writes ASCII files, so it's not hard to transfer your work to another word processor.

It also integrates with the other software in the pfs range, including Graph and File. Data in pfs:File format can be "read" into Write to give it mail-merge capabilities, and pfs:Graph files can be chained with other documents and will print together. The program also supports two printers.

pfs:Write is not one of the heavyweights. But it is inexpensive, easy to learn, and has all the essentials. If you only need a word processor for occasional use, it's worth a look.

WordStar 2000

WordStar 2000 is the big brother to the venerable WordStar. It includes many features which are optional extras to WordStar, such as auto-indexing and mail-merging.

The program is big — it sprawls over six disks — and really needs a hard disk

to work effectively. Installation used to be painful when it was copy-protected, being described by one reviewer as a procedure only a blackjack dealer could love. It's a lot easier now.

Once up and running, WordStar aficionados will see immediate similarities. The menus are at the top of the screen and it still uses control keys to execute instructions. But the lettering has been changed in the interests of achieving a truly mnemonic system. Newcomers will probably take to it

WordStar 2000 really needs a hard disk to work effectively

more easily than established WordStar users because there are enough similarities between the two to encourage the latter to fall back into old habits.

The menu looks uncluttered because there are in fact two menus, and you have to toggle between them if you can't remember how to invoke the command you want. For me at least, that's a minus feature. The program has also been widely criticised as being slow — slower even than WordStar. We haven't benchmarked it, but it certainly seems so.

On the other hand, the package is powerful, with a host of valuable features. You can keep a variety of page formats on disk and call them into your file. You can open up another window and edit a second document in it, or look at a different section of the same document if you want.

The mail-merge facilities are very powerful. WordStar 2000+ can even sort your mailing list. The dictionary which accompanies both versions is excellent, being essentially the same as the CorrectStar dictionary that comes with Wordstar.

Be prepared to do a bit of disk swapping if you don't have a Winchester. There are even keyboard macros — just like having an in-built copy of SmartKey or ProKey. WordStar 2000+ adds auto-indexing, limited maths capabilities and a communications module.

By and large, WordStar 2000 has not been popular with the critics and it is ironic that, if the Focus Organisation is

right, it is still being outsold by the program it was created to replace.

Superwriter

From the same people who produced the long line of SuperCalc versions going back to the days of 8-bit CP/M, comes Sorcim's Superwriter. And a very powerful yet straightforward processor it is.

In style, the program resembles SuperCalc, with a line of command options appearing on the bottom of the screen — first letters only — while hitting the Help key provides a full explanation of these commands. The main menu items include Edit, Spelling Checker, Utilities and Printing. Movement can be via control or function keys.

Like Perfect Writer, commands are initiated by hitting the Escape key. From here you can mark blocks of copy for deletion or movement to somewhere else, search for and replace blocks of text with something else, set line widths, tabs, include text from another document, normalise (make word or line upper or lower case) or capitalise the first letter of each word in a block.

A document history is created and maintained whenever you start a new piece of writing. This history, which is accessible at almost any time, includes such information as the document number, author's name, operator revision number, creation date and date of last modification.

The mail-merge capabilities are extensive, and Superwriter is capable of handling files with records of fixed length. Such files are commonly (and easily) created with a database program. Superwriter can also accommodate variable length fields. However, mail-merging is not one of the program's strong points, being messy, complicated and involved.

The dictionary comes with a library of 20,000 words and you can add your own to the list. Superwriter marks words it doesn't know, but while marked words can be found automatically, the document must be edited to correct the spelling mistakes. Text from another document can be inserted into a document, but you cannot call up anything less than a screenful from another file.

When printing, text from several documents can be chained together to make one large, continuous document.



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WORD PROCESSING

Text inserted this way can vary in size from a boilerplate paragraph to an entire book chapter.

Though not in the class of Samna and Wordcraft, Superwriter is a versatile, well-functioned word processor capable of meeting many of the needs of the modern office.

XyWrite II

A number of PC word processors are based on larger, mini and mainframe systems. Multimate is based on a Wang and Samna is reportedly based on the Lanier system. But XyWrite is the only one actually based on a full publishing house production system.

That system is called Atex and XyWrite, written by a number of former Atex employees, uses the same file format as its big brother. This has helped make it popular with the US printing and publishing industries, but it has more going for it than that.

To begin with, XyWrite does everything in memory and so is one of word processing's speed kings. Though this ultimately limits the size of the document you can work with, it also means that things happen very quickly.

Another parameter in its design was to allow work to be done in the minimum possible number of keystrokes. XyWrite is command driven and uses two-letter mnemonics for the bulk of its commands. This command-driven approach is almost inevitably faster than using menus, but it takes longer to learn.

XyWrite handles headers and footers, running headings, auto footnoting and displays underlines and bold face. You can also create keyboard macros that allow the user to recreate frequently executed sequences of keystrokes at the touch of a key. You can even run other programs from within XyWrite.

Overseas, the program has built up a solid reputation as one of the fastest and most complete word processors on the market. Though its learning curve looks to be steeper than many others, it has good help facilities and a structure aimed at getting the work done in the minimum of time and keystrokes.

Multimate

It may come as a surprise to some, but according to Focus Research, Multimate is at present the best selling software package on the market.

The arrival therefore of no less than

five new versions of the program should win it even more friends. Top of the range is Multimate Advantage, which reportedly comes complete with all the bells and whistles anyone could reasonably ask for, while the bottom of the range is represented by Just Write, which is a stripped-down version of Multimate.

The original Multimate was designed to be functionally identical to a dedicated Wang word processing system, and its advertising emphasised how

Multimate Advantage has been designed for networking

easy it was for a typist to switch from a Wang to Multimate.

Multimate Advantage is certainly one of the powerful word processors. It includes a full mail-merge facility and supports the use of boilerplates, frequently used blocks of material which can be called up from disk or from memory and inserted into an existing document.

It has an 89,000-word Anglo-American dictionary which is reportedly some 300 percent faster than the original. In addition it supports automatic paragraph numbering up to six levels deep, can produce a table of contents, and does line drawing.

But the kicker is that Multimate Advantage has been designed for networking and supports the networking DOS calls built into PC/MS-DOS 3.1, which is IBM's (and by default Microsoft's) promised networking operating system for AT-class machines.

The new Multimate range was released at the PC85 show in Melbourne. We'll have a full review in the near future.

Integrated software

Integrated programs offer special capabilities when it comes to compiling documents. There is, in theory at least, a synergistic effect when you combine all the features of a word processor with a database, a spreadsheet and a business graphics module.

They offer the promise of being able to carry out most of the most common

work in one environment, thus shortening the learning time. In addition, it should be possible to combine the output from all these modules into one complete document. Why have 1-2-3 print an ASCII file so that I can quit the program, load a word processor and *then* load the spreadsheet's output? In Symphony the touch of a key produces a shimmer on the screen . . . and your spreadsheet or database is now a word-processing document that you can format as you wish. In Open Access, the file is written to disk in a transfer format, the word processor loaded and the output brought in.

Unfortunately, this merging often has the effect that no single module is actually as good as a stand-alone module. The word processor modules in both Symphony and Open Access have come under fire from reviewers. The Open Access word processor has been criticised as being slow and cumbersome, though it is very powerful.

Two integrated packages, however, stand out for their word-processing abilities — Electric Desk and Framework. Electric Desk is low-priced (by comparison with the heavyweights) and comprises word processing, database, spreadsheets and communications.

Though it would not qualify as a heavyweight word processor, all the most needed functions are there, and easily accessed via the programmable function keys. You can keep up to nine documents in memory at the one time and transfer text between them using a cut or copy and past technique. Mail-merges are well handled and are more than adequate for most needs.

However, it's the little things in Electric Desk which make it such a nice word processor to use. Things like the transpose function, which many others forget, and the change upper case to lower and visa versa. Though it won't do any of the fancy word-processor stuff such as building an index or automatic footnoting, it will allow you to incorporate data from the other modules into the document.

Framework is quite unlike anything else on the market except perhaps Jazz. Though not mouse-driven, Framework has the same multiple windowing structure.

Framework's word-processing module is excellent, with a well-thought-out keyboard design that lets you move the

WORD PROCESSING

cursor by the character, word, sentence or paragraph. The act of doing so automatically highlights the area in reverse video. It is now selected and can be deleted, reformatted, copied or modified by any other of the applicable commands accessible from the Macintosh-style pull-down windows.

With a graphics card on board, it even becomes a full "what you see is what you get" word processor. Without it, all formats except normal and underline show up in bold.

However, it is the outlining feature that distinguishes Framework from other word processors. A project can be broken up into its logical components and each component placed in its private frame, or window. These can be moved into an outline frame, a frame that allows you to view its contents in several ways and perform functions such as auto-numbering, global formatting, and the creation of an index.

Frames can contain sub-frames, and these can be displayed or hidden in much the same manner as ThinkTank: in a hierarchic structure. Spreadsheet, database and graph frames can be added to the outline and they remain active. Moving a frame moves its contents, sub-frames included, so you can move material about until it is in a desirable order. You can print subsections or an entire document and the formatting commands are about as comprehensive as WordStar's. Lotus has recently added an outlining feature and a dictionary to Symphony to boost its word-processing capabilities, but we had not seen it at the time of writing.

Though Framework lacks some of the more sophisticated word-processing functions such as full auto-indexing and footnoting, it is an excellent tool for the production of business and financial reports.

Wordwrite

MacWrite is a difficult word processor to review. This is partly because there are two different versions around now (the new disk-based MacWrite is available free) and also because it is hard to distinguish the program's advantages and disadvantages from those of the Macintosh itself. So I'm not going to bother; they come packaged together anyway.

However, to be fair, I must point out

that this places MacWrite at an unfair advantage compared to other word processing programs on other machines — the sins of their father aren't always visited on the son.

Let's get rid of some generalisations first. The Mac, with either of the MacWrites or any other of the available word-processing programs, is not the best if:

- You aim to use the computer for fast, high-quality letter or report writing.
- It will be used exclusively by a copy typist.
- The main user is to be someone who types quickly but makes a lot of mistakes.

It is an excellent memo-writer/word processor if:

- You use it yourself for "creative" writing, where absolute speed is not the main criterion.
- It is to be used by computer-illiterates.
- Its primary function is to prepare internal newsletters, reports, and other jobs involving changes in font, size, and in the use of illustrations.

What distinguishes Mac word processors from run-of-the-mill programs on other machines is, of course, the mouse. MacWrite relies fairly heavily on point-and-click technology, and while many people like this approach, it is also the cause of most of the adverse criticisms. "Mice are great in their place," they say, "but they shouldn't call word processors home."

MacWrite has the (now standard) ability to cut and paste paragraphs or sections, to add headers and footers, and to change the layout/format of the page after keying in the text. Gone are the days when these were super new features — we now expect them.

The one over-riding impression you get initially of MacWrite, however, is that it is easy to use. Comparing it to a program like WordStar is like making a comparison between learning to ride a bicycle and a pilot-training course on jumbo-jets.

— Stewart Fist

Wordword

At first glance there is not all that much different between MacWrite and Word. Microsoft has still used the mouse in the normal point-and-click manner but Word provides many key-command options as well.

Microsoft has provided 40 key se-

quences in the program so you can learn progressively while still functioning slowly with the mouse. You can usually choose either mouse or command-keys, so fast copy typists aren't disadvantaged to the same degree as before.

Generally, if you've had a Mac with MacWrite for any length of time you will swap over to Word without any trouble; both programs use all the standard Mac conventions. Microsoft has provided a five-chapter tutorial in the manual and there are extensive Help screens (just type Command-?) within the program, but you probably won't need either.

Some of the features that made Word so much better than the original MacWrite — like the GoTo command — are now available on the new disk-based version of MacWrite, so the difference is no longer so dramatic. The range of type fonts, sizes, boldface, underlining and superscript features available on the screen are the same in both programs.

Probably the major design feature that makes Word better for just general letter writing is that it often gives you a range of command options and lets you choose the method of control that suits you best.

Word also allows you to have up to four document windows open on the screen at the one time. This is more than you would ever want given the size of the Macintosh screen, but it does allow you to refer to notes while working on a report, or to copy and move text easily between documents.

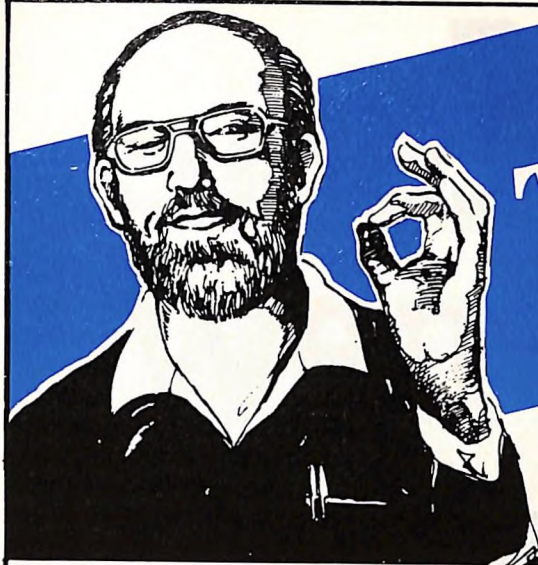
For high-quality letter or report writing, Word also provides you with print drivers that allow your Mac to communicate with daisy-wheel printers.

Word has its own glossary, which lets you store frequently used paragraphs, letters or even outline reports — the size is limited only by disk space.

For people involved in scientific or general business report writing, Word also has an automatic-numbering footnote feature that allows you to display the footnotes either at the bottom of pages or at the end of chapters.

Even more useful to business users is the sophisticated mailmerge function which allows you to establish a small database with fields and a not-so-primitive query language. Instructions can be conditional so a document can be extensively and individually modified.

— Stewart Fist



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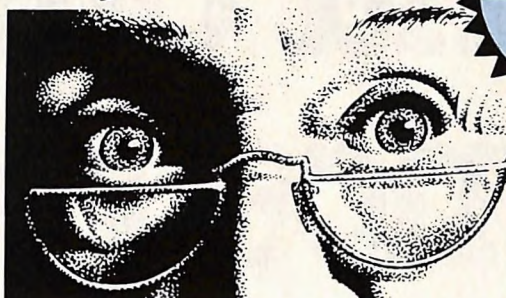
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COMPUTERS IN ACCOUNTING



GREG BARTLEY

David Leong (left) and Ray Diggins: good preparation smoothed the system's introduction



Staying afloat in a sea of paper

Like many big Australian organisations, the accounting department of the State Electricity Commission of Victoria was being flooded with paper. By 1983 the materials and payments section was receiving 300,000 documents a year from 160 stores around the state, with the flood increasing by 6 per cent a year. There were 36 filing cabinets bulging with files and hogging the working space of a couple of dozen people.

By Tony Thomas

A micro-based microfilm system has come to the rescue of Victoria's State Electricity Commission

Today there is no problem, according, to the controller of the accounting department, Ray Diggins AASA, CPA. The department spent about \$83,000 on a microfilming system coupled with a microcomputer-driven arrangement for locating any frame of filmed document with a few keystrokes. "And the system is so easy to use that staff can get the knack in half an hour," Diggins says. The system includes a 3M EF5000 rotary cartridge camera,

ACCOUNTING

two Micrapoint index processing units, and a 3M Whisper Writer (300 wpm).

Good preparation smoothed the system's introduction. A taskforce was assigned in 1982 to reduce the paper volume and processing. After evaluating several microfilm systems, they plumped for the 3M Micrapoint version. It was originally to be used for two document types, but more study confirmed that only one type should be converted at that stage — the material receipt vouchers, which match the details of materials received against the payment details.

With so much detail now available from the commission's mainframe, the material receipt vouchers have little independent use except as a final check whenever there is a mismatch of documents on the mainframe. The mismatches are fairly frequent — about 25,000 a month.

The early stage of the changeover was the hardest because nine months' worth of documents had to be filmed, and real progress in cleaning up the system became evident only from late 1983. Diggins likes the short time it takes staff to learn the indexing and retrieval system, which also aided in winning staff over.

Only two filing cabinets are used where previously 36 were required. A cost-benefit study showed a savings equivalent of one person and shortening of the backlog of payments to suppliers — a win for public relations, even if at a cost. After copping some flak in previous years, the SEC now says that more than 90 per cent of payments to creditors are in accordance with times specified in the contracts.

The main benefits are the intangibles of a better work environment, with improved industrial relations. To have maintained the old system could eventually have led to strife. Safety has also been enhanced; crowds of filing cabinets are a hazard and so is carrying bundles of files and documents. The removal of the cabinets has created about nine square metres of extra space.

"Mis-files and lost documents, which used to be common, are not a problem any more," says Diggins. About 1700 documents are filmed every day. David Leong, who runs the material receipts

voucher section, says a lot of work has been saved because the index system means the documents can be entered into the system in random order as they are received. This cuts down a source of error — documents do not need sorting and shifting about.

Another gain is that several people can access the same document batch instead of one person taking it out of the files on to a desk and everyone else getting frustrated looking for it. The system has not needed full-time operators, as anyone can use it. "One problem is that because the documents are not of uniform size, they cannot be fed into the camera using the automatic feed," says Leong.

In a few swift moves Leong called up a material receipt voucher for a delivery of gloves to the Morwell store by keying in a store and batch number. As documents are fed through the camera, a variable blip system is used to enable identification of about 10 per cent of the documents for indexing purposes. More detailed indexing is not needed. The indexing is 22-characters, covering which of the 160 stores throughout Victoria supplied the goods, batch number, month and year, and opening and closing document sequence numbers for each batch of documents. The film is developed and duplicated by an external firm.

Diggins says documents used to be stored for months in the office, then

moved to secondary storage 15 kilometres away. Now eight years of documents can be stored on film in one filing drawer.

Configuration of the system has recently been changed to minimise the cost of installing a similar system in the contracts and services section of the accounting department. The system is also microfilming wages timesheets for the payroll section, saving the need to retain big batches of the documents covering the 3000 head office workers beyond a period of three months. The microfilming takes only 90 minutes a week.

Downtime of the system has been negligible and the twin consoles ensure no hold-up. The main reason for double consoles, however, was to allow more of the staff to get access without queues.

The system has a lot of potential for productivity and efficiency gain. The microfilm computer could be interfaced with the commission's mainframe that processes payments for materials, with each microfilm index number being incorporated into the mainframe recording. This would require some mainframe modifications, however.

An alternative materials management system is being developed to eliminate the need for material receipt vouchers to be held by the accounting department. This would turn the microfilm system loose for other useful work. ■

Flexibility the key

By Tony Thomas

Accountants hear how to smooth the road to computerisation

Public accountants have a lot of scope to make their clients happier if they approach computer advice jobs with plenty of flexibility. This was the message from David Greenall, a Melbourne accountant with

more than ten years' computer experience, in his address to the Society of Accountants (Victoria) annual congress.

For example, a hospital might ask a public accountant to advise on computerising the system for mailing out letters seeking donations. "You might need to talk to people there ranging from radiologists to welfare officers," Greenall said. "The hospital may not say so, but it probably needs far more than a mailing set-up. It would need to know the donation record of each supporter, and to get an accounting function set-up for processing the incoming cheques, and exception reports on people who fail to cough up this time

ACCOUNTING

around. Possibly systems could also help assess the cost-effectiveness of the entire appeals unit."

Greenall advised managers in the audience to involve the staff when a computer was about to be introduced. "Don't unpack it and say 'here you are'," he said. "Just by talking to staff in advance, they feel more involved. Identify the key people who can be helpful and who can smooth the transition to the computer system."

A little thought in preparation can create a much more usefully detailed system, he said. For instance, engineering company accounts often print out financial costs on installed plant, but the manager might also want to allocate maintenance costs to particular machinery and to be alerted to important maintenance scheduling. Similarly, a transport company might need both gross revenue plus costs per kilometre or vehicle.

"You need to look at each operation and see why it is done, and seek to eliminate unnecessary work. Account-

ant-consultants have a particularly useful role in critically assessing how a firm runs its accounts before the new system goes in."

A lot of suggestions come from people down the line. One junior company accountant managed to get rid of excess

Greenall advised involving staff when a computer is being introduced

data by persuading the management to use an exception-based system in which detail would not be published for profit-and-loss purposes unless an item was more than 10 per cent outside the budget.

"I have seen some profit-and-loss software which always prints every single ledger account in the profit-and-loss statement, rather than grouping and summarising the accounts," Greenall

said. Another consideration is how regularly do you want the account produced? For example, some systems operate on calendar months and others on four-week periods.

Greenall said it was important for accountant advisers to see which external data banks might be useful for the business. Managers often have little knowledge about systems such as Viatel or Ausinet, but in certain businesses they can be invaluable. The costs of using such databases can vary widely and clients will appreciate being given schedules of comparative costs.

Greenall urged that if a manager's company used auditors, the auditors should also be asked their opinion on the system to be acquired. In local government, for example, many shires and cities are computerising and often the auditor knows nothing about it until half-way through the year, which can cause severe problems with the audit process.

Another early question to be resolved is whether the client will need more than

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one terminal hanging off a personal computer. A wrong choice can mean heavy expense modifying the system for extra terminals. Similarly, consultants should be aware of the possibility that the business may need portable computers with interfaces to the office.

How do you decide if one need is more critical than another? "Often no single package fits the bill properly and you have to trade-off on features," Greenall said. "There are statistical systems that assign weights to various features and give you a score per system. Deakin University has developed something like that, but I find all that a bit impersonal. Just talk to people some more. And don't even try to investigate more than half-a-dozen packages."

Asked about maintenance contracts, Greenall said: "With our first computer we put in in 1975, we didn't take out a contract, and after using it all day every day its first service on keyboard and processor was in 1981, although the printer needed regular service. If anything started to go wrong with the system, we'd give it a bash on the side and it would re-start. These days hardware is less easy to re-start and I'd be more wary about doing without a maintenance contract. We don't take software maintenance contracts — our first software was trouble-free for three years before being upgraded. So my answer on maintenance contracts is, hardware — yes; software — it depends."

On mixing and matching peripherals, Greenhall said: "It's vital when you buy that you describe the equipment you already have and demand that the supplier demonstrate the whole system in active operation. It's very common for peripherals to be mis-described as compatible with this or that computer."

ASA executive director Emile Badawy asked if having word processing hooked up to the main computer meant a risk that a computer fault could wreck your word-processing ability as well. "What are the pros and cons of integrated versus stand-alone word processors?" Badawy asked.

Greenhall replied that one problem with integration was that the word processor could use up too much of the computer memory. The worst problem was when the accounting department had an urgent job and the computer was overloaded with non-essential documents.

Another audience member said that if one computer printer was in the form of a daisy-wheel electronic typewriter, you were not crippled if the computer went down. But Greenall said this was not exactly the best of both worlds, because of the typewriter's slowness as a printer and its very limited memory. "But when I list computer requirements for a client, one of the major issues is that the system must interface with the existing electronic typewriters in the client's office."

Discussing detailed accounts, Green-

One problem with integration is that the word processor can use up too much of the memory

all said: "On a recent installation I noticed the system didn't give any details of posting to the general ledger. It only produced a listing of the cheques. Somewhere in the operation the computer remembered that the classification of cheques was \$250 to motor vehicles and \$4300 to advertising, and at month-end the computer added all the ad costs and car costs and posted them to the general ledger. But anyone trying to check whether the sub-totals were right

couldn't do it. And the company got a qualified audit, I might add."

The ASA had a task force 18 months ago to look at trust accounts for estate agents. It looked into the software and some packages had to be modified because they could only print out information at the end of the month. You couldn't find out what was happening in the account during the month. Estate agents who had bought the old versions had an expensive job upgrading. Another system permitted only one run of cheque writing per month. This could be very awkward if your firm's policy is to pay weekly or fortnightly.

Greenall said that in the rush to take advantage of the investment allowance before it cut out on June 30, the scarcity of supply of some models had driven up the price, apart from the effect of the declining dollar. The worst problem was suppliers saying, "Oh, we don't have that model, what about this one?" which is not a good substitute. In the rush, some buyers even forgot the fundamental needs to ensure the purchased system could grow over time and to ensure the right software was available for it.

Greenall stressed the familiar warning about the importance of specifying your needs before you see the salesman. Otherwise the salesman will try to make you forget what you want, in favor of wanting what his system offers. ■

New funds package

By Tony Thomas

System will cover Accounting Standard 12

A companion to the lease accounting software package LEASECAT to cover accounting standard 12 ("sources and application of funds") will be marketed within a month. The system, called FUNDSCAT, is produced by the Melbourne software house CATSOFT with review and authorisation by the Aus-

tralian Accounting Research Foundation (AARF).

The scope of the funds statement was recently expanded from including only public listed companies to applying to all entities from December 31 this year, as well as changing the disclosure requirements to a "gross flow" approach.

CATSOFT systems director and the developer of FUNDSCAT, Robert Lewy, describes the package as a mixture of report generator and word processing. "Because of the infinite ways in which funds statements have been produced in the past, we thought it was necessary to provide a 'palette' of options for accountants to create their own fund statements, while still complying with

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ACCOUNTING

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"We are very conscious that a funds statement is essentially the personal property of the chief accountant, reflecting his or her view of the activities of the year. Nevertheless, when it comes to producing consolidated equity-accounted funds statements, or preparing the many statements which will be required for every \$2 company from now on, we think that accountants' lives will be made a little easier."

The marketing director of CATSOFT, Graeme Macmillan, says that the pioneering standards package LEASECAT has been licensed to 150 sites in Australia. With a typical cost of \$2000 (including maintenance but not discounts), revenue of about \$250,000 appears to have been generated in LEASECAT's first year to July 1, 1985. One big accounting firm has bought four or five applications for its Sydney office.

CATSOFT took a calculated gamble

that the Australian market was ready for specialised software in the accounting standards area. With other products on the drawing board, CATSOFT directors consider that the

Catsoft took a calculated gamble that the Australian market was ready for specialised software in the accounting standards area

association with the AARF has been a big advantage.

Metal Manufacturers' group finance manager, Paul Staddon, published his company's annual accounts containing \$11 million worth of capitalised leases,

using LEASECAT. Other users are significant lessee organisations, including Alcoa, Bond Corporation, Dunlop Olympic, John Fairfax, MMBW, News Limited, North Broken Hill Holdings, TAA and Telecom.

The other supporters of the LEASECAT package have been the finance companies and merchant banks keen to provide clients with an assessment of the impact of their leasing proposals in the lessee's accounts.

The use of computer packages such as LEASECAT to increase the acceptance of accounting standards is still in its infancy, according to AARF director Kevin Stevenson. "The success of LEASECAT has encouraged us to look at a full range of similar products," he says. While primarily designed as a stand-alone accounting package to be operated by accountants on their desktop computer, it has also been interfaced with other computer files as part of a complete lease management system. ■

Allowance hangover

Now that the investment-allowance ordering deadline for computers has passed, a lot of business buyers are going to be regretting decisions made in haste, possibly locking them into installing an obsolete system in early 1987. Many buyers have tried to cover themselves by writing slightly waffly contracts with the supplier — for example, giving certain rights of substitution of model.

However, computer-tax consultants warn that the tax officials will be very curious about 1987-88 tax returns that refer to equipment ordered before June 30, 1985, but only just installed. The two-year phase-out was really designed for large projects, not your \$8000 office computer.

The issue will become: How much flexibility can be in a contract before it ceases to be a contract? This will create a boom era for contract lawyers as they fight the tax cases in the early 1990s. Some people who have placed orders may simply persuade the supplier to turn a blind eye to the contract and supply another system of equivalent value. But remember, buccaners are occasionally caught and hanged.



ON ACCOUNT
by Tony Thomas

When EDP security people meet, horror stories about security weakness in home banking and electronic funds transfer

systems are a common talking point. A visiting US consultant, Bill Lee, tells the story of the time Bank of America president Sam Armacost asked him to try breaking into Armacost's personal accounts.

Lee says he sat down with a personal computer and a phone book, and within 14 minutes transferred \$2.2 million. "I didn't know his phone number, his date of birth or his cheque account numbers," he says. "In any event, Sam doesn't bank with Bank of America, he banks with Security Pacific, for ethical reasons."

Anyone who has looked up tax rates in Portugal and found the printed rates obsolete after last month's budget in Lisbon will be pleased to know that software is now available for up-to-date information on worldwide tax and investment. The software, ITIN (international tax information network), was devised by Touche Ross International as is running in its Adelaide, Melbourne and Sydney offices.

Naturally, the updating and co-ordinating is the hardest job for TR partners. The system holds tax rates and tax treaty details for 186 countries,

ACCOUNTING

and investment and other information for 100 countries. A client can get information on-screen during an interview or get hard copy included in a report. You can discover the relative merits of putting \$1 million into Hong Kong, Seoul or Buenos Aires, or routing through all three of them, with the system spitting out the net savings of various techniques.

During a demonstration *Today's Computers* challenged ITIN to describe both the tax regime and the policy of Bumiputra-isation in Malaysia (progressive shedding of foreign equity to Malays). ITIN did the job.

Canon's national sales manager, Daryl Mahon, reports that several leasing companies are becoming unwilling to write lease deals on computer sales. Normally Canon makes more than 80 per cent of its sales via leases. Even public accountant buyers, with their expertise in lease deals, are sometimes finding it hard to line up a lessor.

Mahon says he sells about 10 per cent of his systems to accountants — usually \$9000 to \$13,000 AS 100 or AS 300 packages (hardware, plus ledger, depreciation and Tax Scheduler PAYE software).

There is growing feeling that the Australian Society of Accountants should add an EDP or IT (information technology) tag to its five specialist qualifications. EDP never got a guernsey on the ground that it was implicit in all specialisations. But aficionados such as Richard Champion FASA CPA, who runs the IT panel on the NSW ASA professional development committee, thinks there is an argument for an IT tag, particularly as more and more accountants are becoming full-time management information systems executives.

Meanwhile, Champion says there is overwhelming response when the ASA puts on its micro courses. A micro workshop he ran at the recent ASA

(NSW) state congress was scheduled for 20 people for three half-days, then blew out to 40 people, then had to be repeated in the afternoon, and then repeated again from 6pm to 9pm.

One option being considered for next year's professional development courses in NSW is a three to five-day live-in course on IT, almost like a state congress, in which there would be multiple learning streams and people would notch up 40 hours of professional development credits in one hit.

"The ASA computer courses are getting real credibility in this competitive education marketplace," Champion says. "The sort of price we can charge members, like \$180 a day, is cheap compared with some other bodies that charge \$300 to \$400 a day." He believes there will be a big increase in professional development activities of all kinds in NSW next year, possibly well over 30 per cent, and, with the new system of contracting out the coaching, an improvement in quality as well. ■

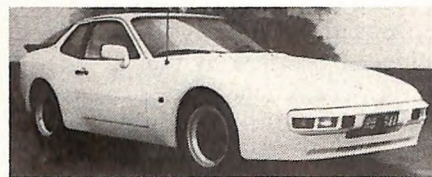
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Consolidations all together

By Tony Thomas

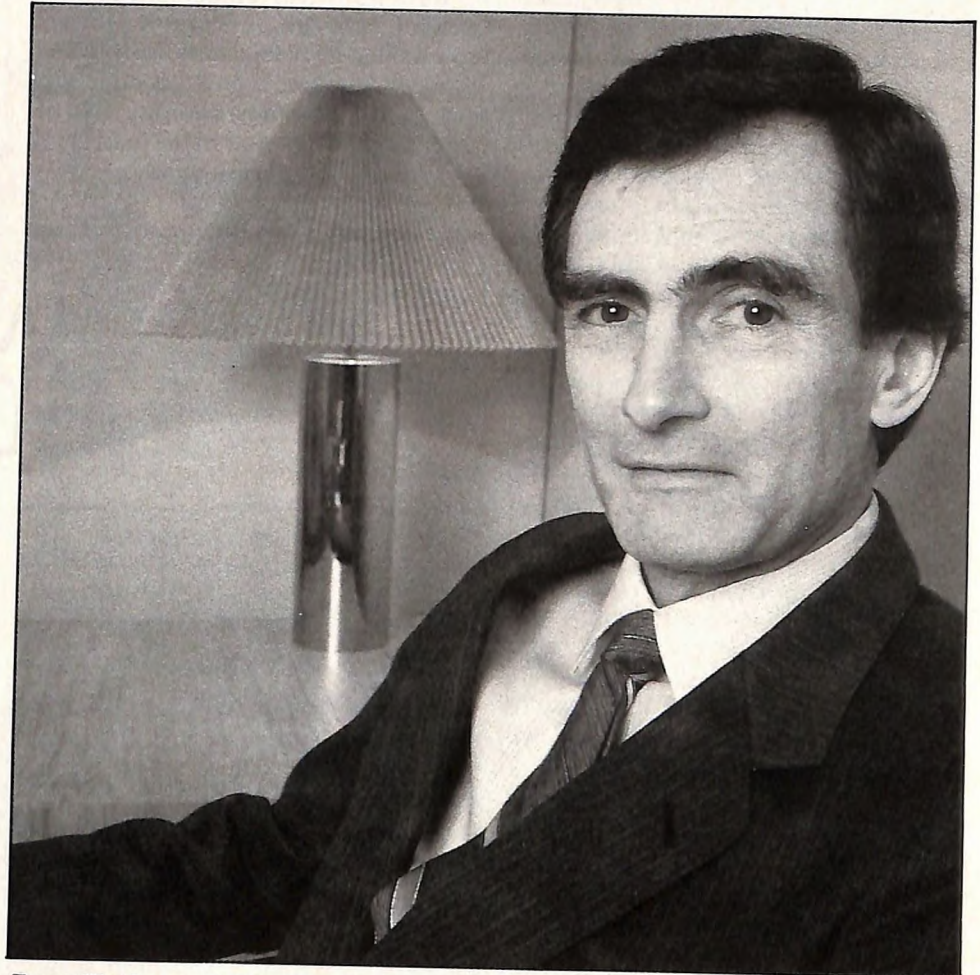
Repco has solved the problems of having 500 operating centres

Group finance directors dream of having their monthly accounts from all operating companies and subsidiaries consolidated at the press of a computer key, almost as soon as the figures are available. This dream is rapidly becoming reality among larger Australian companies, with software packages available at headquarters and even the small operating companies having plenty of EDP processing power.

The problem is often that a single operating company that dithers over its figures (or whose accountant comes down with the flu) holds up the final consolidation. But many groups are getting tougher and insisting that local managers get the bugs out of their monthly accounting before rather than after the statements are crunched out. And even if the local plant or shop has no direct connection to the group computer, the plant can get the results in on floppy disk by express courier — at worst, overnight.

Repco Corp, with its 85 operating companies and 500 operating centres in Australia alone, has gone a long way towards taking the hassles out of its financial reporting and consolidations. Trevor Ward, Repco's group accounting services manager, told the Society of Accountants (Vic) congress in June how the Repco system works.

About four years ago, Repco decided to purchase a Software International financial reporting package, and has installed it in 50 operating companies. The package provides a general ledger, trial balance, and report writer facilities, which allow most company accounting reports to be prepared. "We have called



Trevor Ward: speeding the consolidation of Repco's monthly accounts

it our Finrep computerised accounting system," Ward said. The reports include profit and loss statements, production statements (including reporting of individual standard costing production variances) and cost centre reports.

The package also caters for budget preparation, including facilities for flexible budgets. It is very useful in companies with a large number of cost centres, and has sped up the reporting of the results of the more than 300 Repco individual merchandising branches. The system has also been adapted to prepare the monthly company, divisional and group accounting packages by use of special input, rather

than direct extraction from the live general ledger accounts.

The advantage is that divisional and group consolidated accounting packages are prepared immediately monthly company packages are completed, without manual intervention. Consolidation is achieved through the relationship file, which links the various levels of accounts throughout the system. Each item is input only once, and all additions, subtractions, percentages and variations from budget are calculated automatically.

This has eliminated the time delay involved in consolidation of divisional and group results, and provides a facility

ACCOUNTING

either to speed up reporting of results or to give individual companies more time to analyse their results before submitting them for corporate consolidation.

"The Finrep system is an important tool in preparation of reports on measurement of divisional performance," Ward said. "In the control area, the Australian half-yearly balance sheets are produced live from the general ledger and consolidated to divisional level by means of the consolidation facility in the Finrep package. Those companies who are live on the system have their balance sheet automatically extracted, and the remaining Australian companies prepare special input using similar principles to those applied for monthly accounting packages."

At question time, Ward was asked: "If many companies in the group are reporting 'live', some are presumably not live on the schedule. How soon after the 'live' reporting is finished do the non-live reporters enable you to complete the consolidation?"

Ward said it depended how good the non-live company's general ledgers were. If computerised, they could have a facility for automatic extraction of the figures for head office. "So the process might not be held up at all, but it is an advantage to pull the figures live without human intervention," he said. "That saves time and transcription."

Asked about the degree of management input into the figures, as distinct from mere computer-produced figures, Ward said a company manager would appraise the draft account and summarise them before letting them go to head office. "That's one thing that holds us up, managers taking a pretty close look," he said. "Sometimes it's hard to extract the figures."

Ward told the seminar that Repco has two major EDP installations in Australia, one servicing the merchan-

dising companies and one servicing the manufacturing companies. There are also several medium-size computers and distributed processors, either operating independently or supporting the major computer installations. It also has major computer facilities in the US and New Zealand.

Repco's involvement with EDP started through inventory control, scheduling, invoicing, sales analysis and debtors, but there is now a comprehensive suite of programs covering most of the accounting aspects of the individual company's operations.

Terminals have been installed at most merchandising branches to enable preparation of invoices by EDP, issue of daily sales and costs of sales reports by branch, with exception reports on items that need to be brought to management attention. This extends the measurement of divisional performance to branch level, and is a valuable management tool.

The system also provides a facility for automatic branch stock replenishment, and enhances control and auditability with the facility for selective physical checking of stocks. ■

Growth in security

By Tony Thomas

Consultants say the local market is in its early days

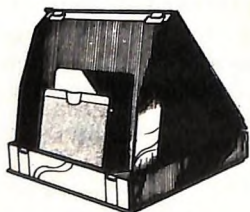
Coopers & Lybrand now has a group of 55 to 60 computer security consultants, which it claims is the biggest such staff in Australia. In Sydney there are 25 staff and Melbourne has 15. Moreover, the growth is running at 30 per cent a year. None arrived with the W. D. Scott merger. Coopers says fees can't be extrapolated from the staff number because so much time is used on training and research and development, with virtually all staff getting a chance

for refresher courses with Coopers US. The group originally grew out of audit and general computer consulting, but

Paul Okkerse, AASA CPA, the national computer audit and EDP manager for Coopers, says the W. D. Scott merger has helped by creating an added pool of high-tech people, called the information technology group, who might need to be called in on security jobs.

"The security market is in the early stages here," Okkerse, 36, says. "We foresee sharp growth but we can't put our finger on the likely dollar turnover. In the US, security has been shown by successive surveys of company managers to be becoming one of their main preoccupations."

"Managers here are recognising that their investment in EDP technology is getting pretty large, and moreover they



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ACCOUNTING



Paul Okkerse (left) and Kathleen Goddard: on the lookout for computer security lapses

are getting their strategic analysis data on to the forefront of their EDP projects. That increases the risks from security lapses."

Coopers' marketing of security consulting in Sydney is being handled by Kathleen Goddard, 34, a CPA from the US with five years added experience working for the First Interstate Bank Corp in Los Angeles, with 21 member

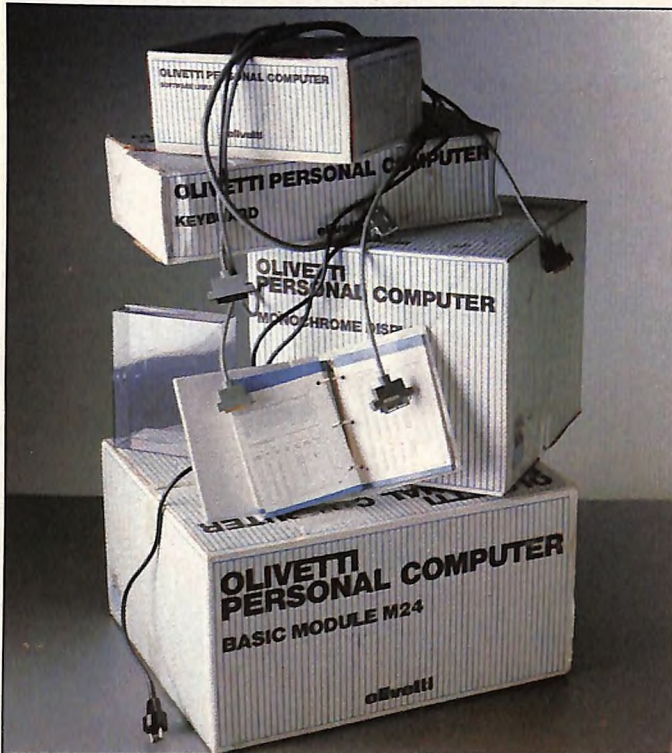
banks. She specialises solely in security rather than an audit/consulting mix. A similar job is about to be created in Coopers' Melbourne office.

Partner Jan Muysken, 33, who has been in computer work since he wore short pants, says Coopers' clients in the US commonly pay fees running into six figures for security advice and help. In contrast, many Australian

clients are small, with maybe a \$100,000 investment in their whole system, but the fee problem is eased by much readier availability of security systems software. Muysken says the pattern among his clients tends to be a security review in the first year, followed by monitoring and review in the second and third years, and another major review after that. ■

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Mike McColl Jones plunges into the silicon pool and comes up spitting chips

According to the *Concise Macquarie Dictionary*, a computer is "an apparatus for performing mathematical computations electronically according to a series of stored instructions called a program". As far as I'm concerned, the definition should read, "A bloody apparatus that defies description".

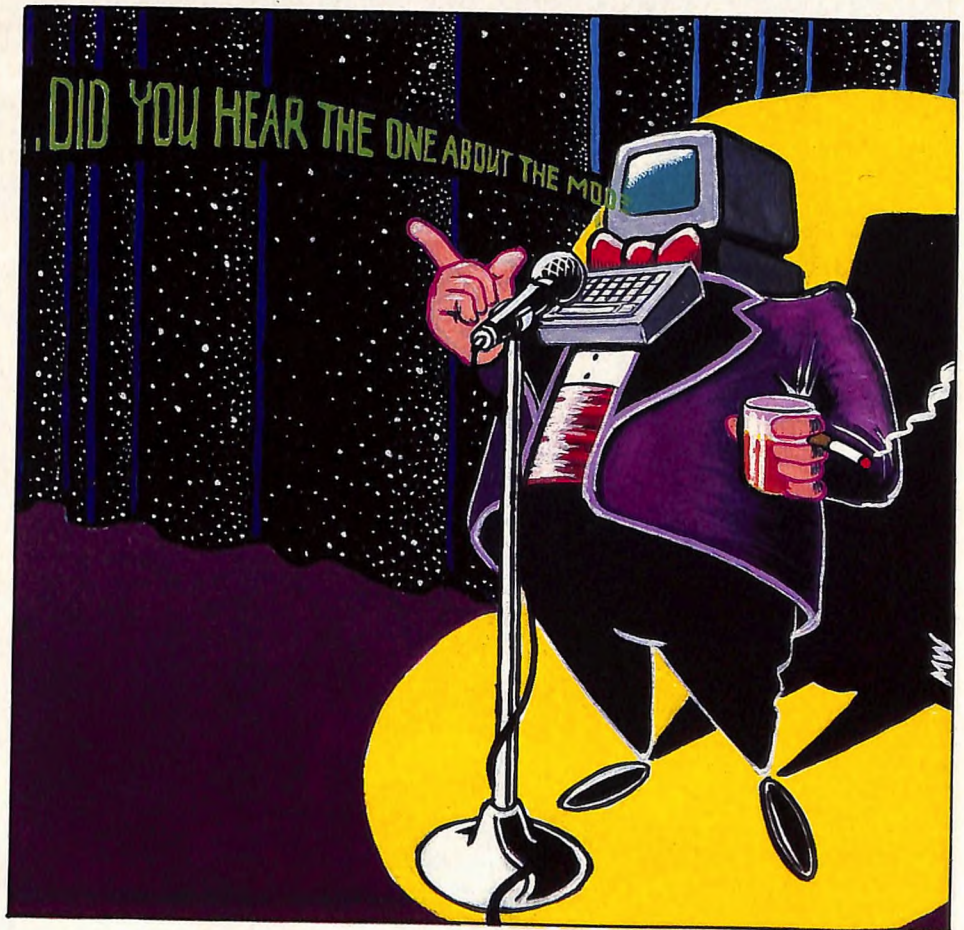
I'm not the sort of person who would automatically "take to" a computer. That would be roughly akin to Alan Bond being appointed commodore of the New York Yacht Club, or Lang Hancock using Meals-on-Wheels.

I think the first time I was aware of a computer (apart from reading about them in *Buck Rogers* comics — you know, the ones which invented all that gear before NASA) I was told by an airline executive some years ago that the name McColl Jones, with initials, wouldn't fit on the ticket. He said the computer was new and wouldn't take a long name like mine. "Would I mind an abbreviation?" he asked. "Yes, I would mind," I said. "I hate flying anyway, and if I'm going to go down in flames, I don't want my name abbreviated as well as my life."

I know that knocking computers in this magazine will be a bit like Mother Teresa writing a column in *Playboy*, and I don't intend to be a computer knocker. I'm only talking about computers as they affect me — and they do, as they do everyone.

For example, look at the things that have been achieved without the computer:

☐ In the Garden of Eden, Adam used



an apple, not an Apple, to get the human race rolling;

☐ Man certainly didn't invent the wheel with a computer, nor did script writers use a word processor to compile the *Bible*;

☐ The chips off the old block that Henry VIII used weren't silicon, and if computer dating had been around then, perhaps he wouldn't have had all his marital problems;

☐ Napoleon had no computerised way of predicting the weather for his trip to Moscow, or perhaps he would not have gone. But then the world would not

have had the magnificence of Tchaikovsky's 1812 Overture;

☐ Christopher Columbus managed to discover America without the use of computerised navigation aids;

☐ The first Olympic Games marathon was held in July 776BC (I don't know the cost of tickets), and officials didn't need a computerised timing system;

☐ Joan of Arc didn't have the advantage of a computerised hazard warning system, or she'd have realised that it was a day of extreme fire danger;

☐ World War II, which contrary to popular belief was not started by Vera

HUMOR

Lynn's manager or K-Tel records, probably would not have happened if Adolf Hitler had received some sort of decent vocational guidance. Using computerised information, he may well have decided against a career in politics, and instead pursued his original job as a paper hanger. He could easily have become Europe's leading interior designer; I can just see him giving a quote that you couldn't refuse.

Unfortunately, World War III WILL be computerised, but who cares? It probably won't last long enough for video companies to make cassettes of it anyway. It's a pretty depressing thought, but according to everything they tell us, God's creation of the world in six days took infinitely longer than those idiots will take to end it.

I don't know whether it's a good thing that history didn't have the aid of computers, but they are here now, and here with a vengeance. Look at some of the things we can do, with their aid.

We don't have to rely on going into banks any more. Nowadays we can all withdraw money outside the bank from

a computerised teller. You put a plastic card in, press some secret numbers (so secret that you generally can't remember them yourself), and hey presto, whatever you've asked for slides into your hand, provided of course that you have enough money in the bank. These automatic tellers hold so much fascination that I've seen grown men insert coins into them and stand back waiting for a jackpot.

In Japan, computers are so sophisticated that when you shop at your local supermarket you don't take one of those infernal shopping trolleys that look like the contraptions Douglas Bader used to help him walk. Instead there's a robot that walks with you and carries your shopping. It is a new world, isn't it? Let's just hope that it is a safe way to shop.

So far as I'm concerned, computers and robots are one and the same — each went to hospital to have a charisma bypass operation — but the important thing is that they ARE taking over. As well, they are becoming more lifelike. For example, the United States of

America even uses one as a president. But why don't the designers get their act together and design attractive robots. I'm sure most blokes would love to see one that moves and looks like Delvene Delaney.

I suppose that all things being considered, the time won't be far off when a normal type of bloke actually meets and falls in love with an attractive female computer. Can you imagine a fellow saying nervously to the newest computer love of his life: "I didn't know whether to get you a box of Milk Tray or a can of Castrol," or, at the end of a beautiful evening, he and "she" booking into a motel, "she" shedding her flimsy negligee and he his 'jamas, and "she" suddenly saying, "Not tonight darling, I've got an oil change."

I purposely haven't tried to paint a gloomy picture as far as computers are concerned, but let's go back to World War III. It'll all be run by computers, or more likely it'll be a giant ATARI game connected to each of the world powers, the US, Soviet Union, China, India, Japan and Fiji (I include Fiji, because you never know what they have got duty free). Because of their technology, I've got my money on Japan. In fact, I'll bet they even time the war for when all the major defence chiefs are at lunch in a Japanese restaurant: by the time they get their shoes back on, it will all be over.

Now I haven't deliberately set out to rubbish the computer — I know it's here, and it's here for keeps, and it can do the most wondrous things. It can lead us to the outer limits of space itself, it can help with the most intricate surgery, it can forecast the weather in the most minute detail (except in Melbourne), it has helped us to reduce the time we work and create more leisure time, so that whereas we used to be bored for only an hour a week, we can now be bored for six, it can help us find an ideal partner, and it helps us travel the world faster and safer than ever before (you can now travel from New York to London in less time than it takes to find your luggage at the end of the trip).

As far as computers are concerned, the sky's the limit. Who knows who will be computerised next . . . computerised next . . . computerised next . . . computerised next . . . computerised next . . . computerised next . . . computerised next . . .

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Tulpi modem

In personal computing, the need for telecommunications is growing rapidly, but due to the nature of personal computing, users often have to assume responsibility for it. This means an increasing need for reliable modems to connect them to computer networks.

The Tulpi is an Australian-made package and comprises an external modem and line connection unit, a push-button telephone handset, a disk with MITE communications software, and manuals for both modem and software.

The modem box measures 260 x 64 x 250mm, so it is compact enough to fit on or under a desk top. It has a LED status display and a loudspeaker, and connects to a male RS-232 cable. The product does not come with any cabling options, which could be a marketing problem for Telecorp.

The documentation for the Tulpi is brief though adequate. However, given the absence of ready-made cables, I would like to have seen documentation for connecting the Tulpi to a range of host computers. The MITE software is well documented, but the interface of MITE to Tulpi modem commands is not documented at all. This oversight is being rectified by the modem's maker, Telecorp, and its staff are extremely helpful on the phone.

Pulse and tone dialling are supported so international calls can be made, and auto-dial and auto-answer features are also available. All the Tulpi's features are accessible from the keyboard or

from the host computer. It has an internal buffer that allows the user side to communicate at speeds up to 19.2K baud while the line speed is automatically set according to the requirements of the telecommunications network. This makes it extremely useful for those networking PCs to a remote database or to another PC, thus requiring different line speeds.

The modem has a "long line" feature that is designed to detect data transmission errors in areas where line noise is a problem. When data transmission is degraded to a point where reliable communication is impossible, the Tulpi will automatically disconnect. This saves the user from receiving (and paying for) corrupted data.

Optional enhancements available for the Tulpi include a self-adjusting baud rate in auto-answer mode, and a welcome page to ensure that incoming calls are sent a message if the host computer has not responded within a specified time. A spooler also allows the Tulpi to buffer up to 8K of data. This is extremely useful as the buffer can be filled at the speed of the host (19.2K baud maximum), leaving the host free to continue with other computations while the data is sent down the line.

The software, MITE, is well documented and comes suitable for either MS DOS or CP/M systems. It is menu-driven, with a comprehensive range of options that can be set and saved in a disk file. However, the real advantages of MITE are that it runs on a large range of CP/M and MS DOS machines, the Apple II and the Macintosh, and that it supports both binary and ASCII data transfers as well as Crosstalk, Hayes, Xmodem and MacTerminal protocols.

The only disappointment was that Telecorp has implemented its own command language for the Tulpi, thus isolating it from much of the existing software based on the Hayes Smartmodem command protocol.

The Tulpi modem is well designed, and the "long line" feature is especially useful given the questionable quality of some Telecom lines. Its ability to receive data from other systems and correctly decode their communication protocols makes it a powerful product.

However, it still has some minor flaws. The documentation is not written for the user, lacks examples, and is (at the

FACT FILE

Product: Tulpi Modem

Price: \$989

Requirements: 128K, RS-232C port, MS DOS version 2.0 or higher, or CP/M 86.

Communication formats: 300 and 1200/75 baud (videotex)

Features: Pulse or tone dial, auto-dial, auto-answer, auto-disconnect, supports US (Bell) protocols and CCITT protocols, auto-selection of correct transmission speed. Not Hayes Smartmodem command compatible

Documentation: Tulpi, fair; MITE, excellent.

Supplier: Telecorp, (02) 450 2522.

time of reviewing) incomplete. The lack of suitable off-the-shelf cables further removes the product from novice use.

— Chris Doney

Chris Doney is senior analyst/programmer for the centre for research in finance at the Australian Graduate School of Management.

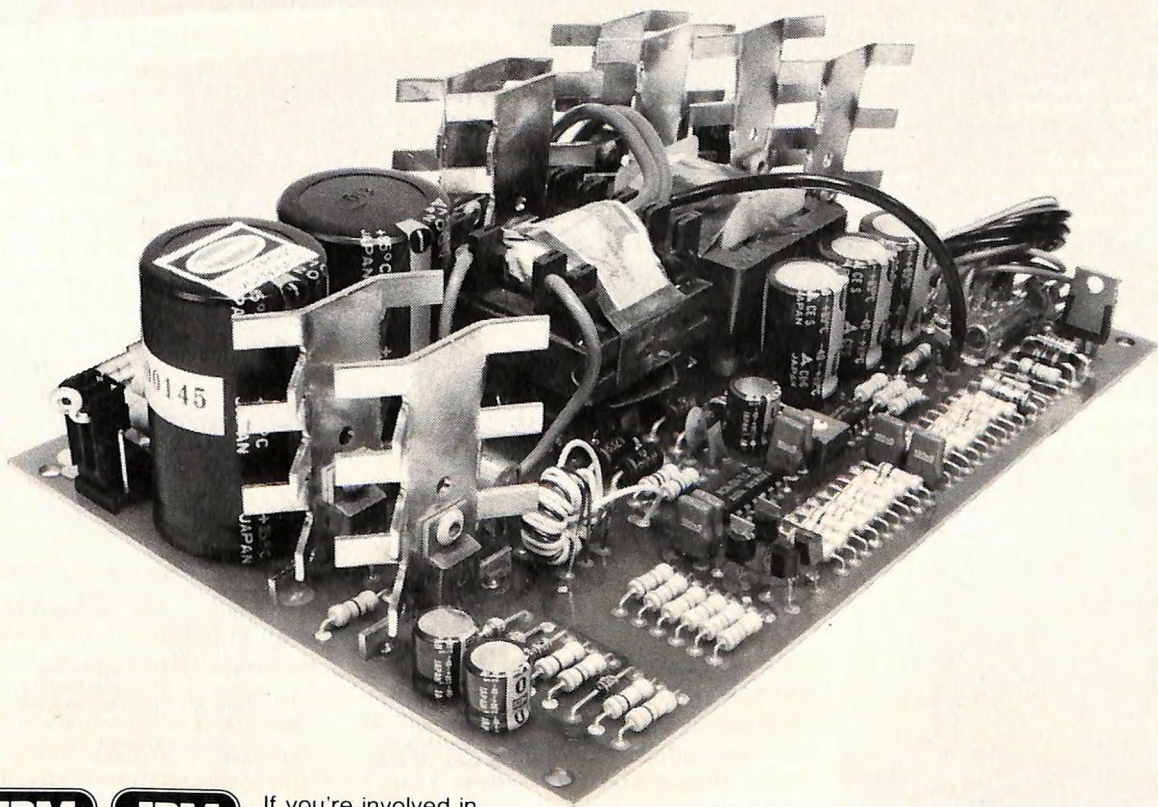


Comeback is good value

Commodore PC 10

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Technical Data - HR31 200

CRT Size:	14" Diagonal (34cm)
Tube:	Black Matrix
Sync-H. Scan Frequency:	15.7kHz
V. Scan Frequency:	60Hz
Signal Type:	RGB I: TTL Level Positive
	Sync H/V: TTL Level Positive
Display Size (H x V):	245mm x 170mm
Retrace Time (H x V):	0.5Ms x 0.4msec
Resolution:	640 x 200 lines
Input Terminals:	9 pin "D" type connector
Dimensions:	11"(H) x 15"(W) x 13"(D)
	266(H) x 367(W) x 318(D)mm
Shipping Weight:	15.9kg



Model HR31 200



Models HR 39 & HR 134

Technical Data - HR 39 & HR 134

CRT Size:	12" Diagonal (29cm)
Phosphor:	HR 39 (Green); HR 134 (Amber)
Sync-H. Scan Frequency:	18.432kHz
V. Scan Frequency:	50/60Hz
Signal Input:	Video - TTL Level Positive
	Sync H - TTL Level Positive
	Sync V - TTL Level Negative
Video Response:	20MHz
Display Size (H x V):	203mm x 135mm
Display Time (H x V):	44Ms x 18.99msec
Resolution:	Centre 1,000 lines
	Corner 800 lines
Display Formats:	9 x 14 matrix, 2000 characters in
	80 x 25 format
Input Terminals:	9 pin "D" type connector
Dimensions:	10.5"(H) x 15"(W) x 12"(D)
	257(H) x 367(W) x 294(D)mm
Shipping Weight:	11.36kg

All models: 240V AC/50Hz

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BENCHTESTS

crest of a wave based on the original Commodore PET. But Commodore chose to go after the home computer market rather than the business market and the chance was missed.

Now, seven years later, Commodore is making its belated pitch at the business community in the shape of the Commodore PC 10 and the hard disk PC 20, two IBM compatibles which it makes in West Germany.

The machine is creamy-white, and, though basically a rectangular box, looks quite elegant. The disks are at the right, with the name badge on a plate to the left. The color and styling are echoed nicely in the monitor.

When started, the Commodore displays its ROM serial number, then issues a chirping sound to signal that it is ready to start loading from the disk. The disks are Canon units made under licence by BASF and they are just as quiet as their Japanese counterparts, except for one thing. The BASF units lock the drive doors when they are running, which is a good safety measure, but they make a loud clack when they do it. This is a pity because, apart from that, the Commodore is one of the quietest machines around. The fan issues a low hum which is barely audible above the average air conditioner while the disks are virtually inaudible except when they go into their clackety-clack routine.

Although I didn't have one for review, I saw the hard disk units at Commodore's premises in Sydney and they were very quiet. Since you'll be spending most of your time working with the hard disk, the clackety-clack problem won't turn up too often. The hard disk parks the heads automatically every time it finishes an operation so there's little likelihood of accidental damage here, either.

Although it too has a tendency to go clackety-clack, the keyboard is excellent and the layout exceptional. Commodore has taken more liberties than just about any other company in the layout of the keyboard, and most of the changes are for the better. The Control key is right where you would expect to find it, while the Alt key is right next to it.

Some of the symbols have also moved from their normal PC location, the double-quote, for example, migrating from the right of the keyboard to a position above the 2 key, where you

FACT FILE

Product: Commodore PC 10

Price: \$3700

Hardware:

CPU: 8088

Speed: 4.77 MHz

Memory: 256/512K

Disks: 2 x 360K 5¼ inch floppies

Display: 320 x 200 pixels

I/O: parallel and serial

Software:

System: MS DOS

Language: GWBASIC

Applications: None supplied

Documentation: User's manual,

GWBASIC manual

Supplier: Commodore Business

Machines, (02) 427 4888

used to find it on a typewriter. A pitch at the boss's secretary, perhaps. You will have to make sure you load Commodore's version of MS DOS when booting or the computer's key assignments won't match the layout of the keyboard.

The number pad is still on the right but it has been separated from the qwerty keys. There are indicator lights embedded in the Caps Lock and Num Lock keys, and many of the keys, including Shift, Scroll, Lock and Return, are usefully oversize.

The keyboard is tilted slightly, and two retractable legs at the back allow you to tilt it further. At its steepest setting, it tilts more than any I have seen.

The feel is crisp and tight, though with a slightly heavier action than usual. It's not objectionable, just noticeable. All the keys are nicely sculpted with the J and F keys — the touch-typist's home keys — sculpted more steeply than the others. This helps the typist to find the keys by feel alone, but there are more positive ways of doing the same thing.

The screen is not as good as it could be, the picture on the test machine being a bit fuzzy, especially with bright text. What's more, there were obvious convergence problems, with bowing at the top and sides of the screen. No graphics card was supplied, so we cannot comment on this aspect of the machine's performance. It will, however, accept any of the standard IBM monitors.

Compatibility looks good, with the machine happily running Framework, Sidekick, SuperCalc 3 Version 2, Con-

current PC DOS and WordStar, along with all my regular utilities such as Smartkey and DOSEDIT.

Opening up the computer is straightforward, with six screws to remove. Once inside the machine shows a high standard of construction. The boards are lovely, as good as the Canon A-200's. Everything is on the motherboard, including a slot for an add-on 8087 maths co-processor chip and sockets for an additional 256K of memory.

Installing the chips will be a fiddly job however since access to that part of the board is restricted by the back of the disk drives. Fortunately, it is a job you will only need to do once. There is also room next to the disk drives for additional disks, and Commodore says the standard power supply is beefy enough to take up to two hard disks.

A video board occupies one slot, leaving the other four free for you to use as you see fit. They are standard IBM sockets and we expect they will support all IBM compatible accessories. The processor is an 8088 running at 4.77 MHz, just like the IBM PC, and performance is on a par with the market leader. Indeed, the Norton Utilities SYSINFO program gives the Commodore a performance rating of 1.0, the same as the IBM PC.

The documentation — user's manual, DOS and GWBASIC manuals — is well written and clearly presented, one of the best I've seen in a long time. There's even a DOS quick reference card. But there is one glaring omission: there is not a word about the need to reset dipswitches when the machine's configuration is altered by, for example, the addition of more memory or a third-party color graphics board. Commodore is aware of the oversight, and says it is sending out errata sheets to all the dealers. If you buy it, make sure you get one.

Finally, there's the bottom line, the price. The PC 10 sells for a very reasonable \$3700 for a twin floppy system and 256K of memory. It may not be the biggest bargain in the IBM-compatible marketplace, but it represents good value for money.

The Commodore PC is the company's belated entry into the mainstream business market. I expect that, aided by an aggressive advertising campaign, the machine will sell well. It is soundly built

BENCHTESTS

and good value for the cost conscious businessman.

Commodore is likely to be one of the stayers in the computer business. And this machine is an indication of how serious the company really is.

Gary Ross



Limited capabilities

Sharp PC2500

The fact that I have yet to see anyone using a portable computer in the bus probably means that this particular technical innovation hasn't made many inroads in Australia. There are, however, a wide selection of makes available, and an even wider selection in the pipeline, all presenting various features to the prospective buyer.

The Sharp PC2500 isn't in the same league as the Data General One, Hewlett Packard Portable or other similar equipment with built-in drives and 80-column screens, but neither is the price.

The PC2500 is a neat, light machine (1.5 kilograms) with a footprint about A4 size. It incorporates a full but close-spaced keyboard that includes a numeric pad, a built-in four-color plotter/printer that uses 114 mm paper, and a four line by 24 character LCD display. There are 10 additional function keys to drive the built-in software, and the machine I was using was fitted with a 16K RAM expansion card, which gave a fairly

FACT FILE

Product: Sharp PC2500

Price: \$545

Hardware

CPU: 8-bit CMOS

Speed: N/A

Memory: 5/21K

Disks: No (cassette interface supplied)

Display: 4 line x 25 char LCD

I/O: Serial (not RS-232 compatible).

Software

Language: Basic

Applications: simple spreadsheet, phone directory

Documentation: 360-page book

Supplier: Sharp Australia

miniscule 21K RAM total. The RAM is fitted with a backup battery.

The machine has no built-in disk drives, but interfaces are provided for cassettes, data storage and serial I/O. The I/O is basically designed to drive a big printer plotter or transfer data to other micros, but unfortunately very little technical information is given on the use of this facility. Power is provided by built-in batteries which are charged by a supplied AC adaptor. Battery life is reduced by extensive use of the printer/plotter, with 450 lines of printing enough to exhaust a full charge. Printer output is consistent with the cheaper pen-based systems — all right for graphs, but not very good text.

What can you do with the PC2500? The lack of storage is probably enough to give you a clue, even though RAM storage is supplemented by 72K of ROM containing a Basic interpreter, a simplistic spreadsheet, and a telephone directory.

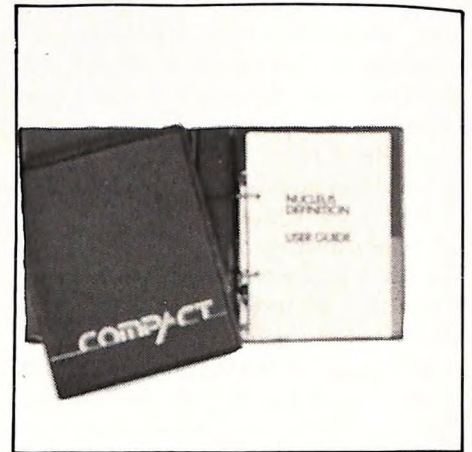
To carry out calculations the Basic run mode is used, with screen entries and final calculations automatically output to the printer. The Basic commands are generally consistent with a cassette-based system, with additional commands that control the printer and graphic functions.

The next facility is covered by the rather pretentious menu title business software, and if you think that this means word processors, spreadsheets and communications, you are wrong. The software simply allows you to set up a form of spreadsheet and output the data as bar, line, band or pie charts. The

size of the spreadsheet is limited by the memory available, with a 20 by 50 matrix available with the 16K RAM expansion. The spreadsheet is extremely limited. In fact, I found using the spreadsheet on the small screen totally frustrating.

Perhaps one's expectations change with increasing advances in technology, and although a few years ago the PC2500 could have been classed as a portable computer, by today's standards a smart calculator is probably a more apt name. Certainly, for those wishing for something more advanced than a hand calculator for mathematic or engineering applications the PC2500 with its built-in color plotter/printer could well be worth considering; however, anyone with any true business requirements would not be able to live with the small screen and limited capabilities.

— Geoff Warrenner



Deleting the drudgery

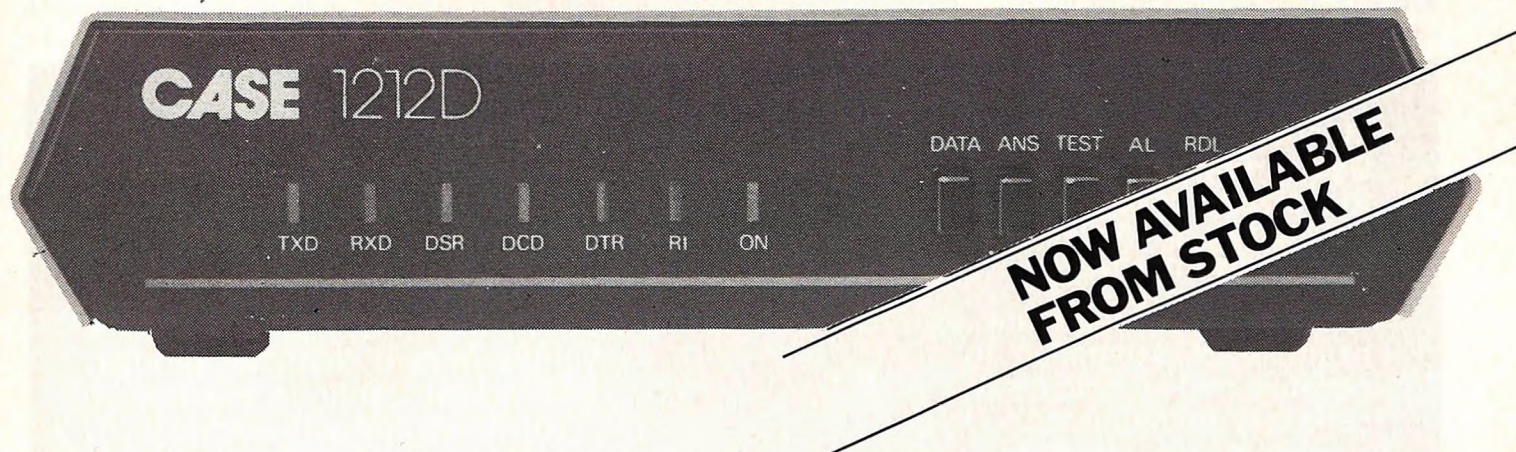
Nucleus

Programming involves developing routines to read and write data files, routines to index data, routines to format readable reports and data entry screens, and on and on it goes. There comes a time when these repetitive, time consuming tasks lose some of their attraction.

Nucleus is a program and report generator that aims to take the drudgery out of program development. It generates interpretive Basic programs, which can be listed, altered and saved for later

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BENCHTESTS

FACT FILE

Product: Nucleus
Price: \$900 (\$625 per module)
Requirement: MS DOS, CP/M,
Concurrent CP/M
Documentation: Good
Skill level: Intermediate
Distributor: Compact Software P/L
(02) 37 1933

use. Nucleus comes with its own Basic interpreter, Jetsam, incorporating an indexed file handler, which allows up to seven keys per file. All of its generated software uses sophisticated indexed sequential file-handling routines, which gives the user lots of flexibility in accessing data. This feature makes for speedier and less cumbersome program development, where information must be provided in various sequences and where access to the one file is needed by means of more than one key.

Documentation is usually a good place to start looking when assessing a product. The Nucleus manual is more a tutorial than a reference manual, especially since it has no comprehensive index. But the content is concise and logical, and the text is well written and extremely readable. I managed to read through the entire document before running the software, and found it communicated very well what I could expect from the product.

After an initial reading of the documentation, I managed to operate Nucleus with very little reference to the manual. This is mainly due to the software's extensive use of prompts and lists of available choices displayed on the screen. There are no commands to remember, and there is generally little doubt as to what Nucleus wants you to enter next. In some instances, I found the use of the confirmation (Details OK. Y/N?) excessive, where it occurs after almost every keystroke.

All programs and systems generated by Nucleus are automatically entered on to the appropriate menu for later selection unless you build a temporary program. These menus can also be altered by the user if necessary. A three-level system of menus is provided with all Compact software, allowing for selection at a company, system and program level. Password protection is also provided at these three levels.

The Nucleus menu contains all the options needed to develop the application. The first step is to create and define the system to be developed. The user then describes the files to be used within the system for data storage, their contents, and how the information is linked between files. With this information, Nucleus generates the programs needed to validate and store information within the system.

The report generator within Nucleus

enables you to produce a wide range of reports from newly generated systems, or from existing Compact accounting packages.

Compact has a complete set of packages covering such functions as debtors, general ledger, order processing, invoicing, sales analysis, payroll, creditors and purchasing. Quite a few of these modules are already available for a multi-user environment, and Compact claims that Nucleus-generated software can easily be converted to multi-user. Nucleus will allow the development of programs to complement these accounting systems, making use of the file definitions provided with the standard packages.

For the purpose of this review, I used Nucleus to develop a stand-alone conference registration application. Within a couple of enjoyable hours I was able to develop 10 working programs, which handled the registration of people attending at a conference, their allocation to rooms, processing of payments and numerous reports. It even built a program to write letters to people who had registered prior to the conference without paying sufficient deposit. Here are the steps I followed . . .

First, Nucleus asks you to describe the system you are dealing with. The name of the system automatically becomes an entry on the main menu for subsequent selection.

Defining your files is an area where careful planning pays off. You need to decide whether your file is a master or transaction file. You need to know what information you wish to hold on a file, and the format of data fields to be used. For each file, the system requests information on the fields to be stored. For each field, the user is requested to provide details including the name of the field (for example, account number), the type of field (alphanumeric, numeric

or date), its length and precision, and some validation parameters to allow the generated program to edit the data entered on to the file. Nucleus will also ask you to define the order or index by which data is to be retrieved from a file.

In certain situations it will be desirable to code certain pieces of data and to store the explanation of these codes in a separate file. For example, on an employee record, rather than carrying the full department description on each record, a department code stored on the employee record could be linked to a department descriptions file.

The system also needs to know how the records on one file are related or linked to another. For example, a transaction file may be linked to a master file on account number. I used the file linkage to match a file of payment transactions against a master file of people attending, as well as to validate input fields, and to provide for looking up descriptive details on reports generated.

Having defined a system and the files and fields within the system, it is then a matter of calling the Create Update Program step, and selecting your requirements. Prior to generating the update program, Nucleus allows you to fine-tune the program by telling the generator what editing and cross-checking is to occur between files linked together, and whether any information entered into the file should automatically update fields in any other files. For example, while generating a transaction program to take in payment details, I requested a running balance on each debtor to be kept in another master file. This requires the entry of a simple equation that specifies the way in which the update should take place.

Nucleus then generates the program code. If you have specified this program to be a permanent one, the program will be placed on the menu for selection. When selected for execution, the program will allow you to enter new details, and make amendments, inquiries and deletions to the file, and at the same time update any relevant linked files.

Two levels of reporting can be generated by Nucleus. The master file print program provides the simplest level, where the format of the report is not important. Nucleus will generate a file listing program showing details in column form.

BENCHTESTS

If some control is required over the format of the data to be printed, an option exists to select the fields and specify the format of the information to be printed on the report. A series of prompts will guide the user through the steps of defining headings, the spacing between fields, the order in which records are to be printed, selection criteria for including or excluding particular records, subtotalling and totalling. While constructing the report format, I was able to do a "test print" and clean up the layout of the report, before proceeding with further definitions.

Apart from the report generation facility, Nucleus can generate programs to print labels and to write letters. The letter-writing facility allows the extraction and merging of information on the accounting files, with text that you have set up to form the letter. For preprinted stationery applications Nucleus allows the development of simple invoicing or statement print routines, once again using information extracted from files on the system.

For the purposes of documentation, it is possible to print full details of files created, showing fields and file linkages within the system. This feature is essential for programmers wanting to maintain or modify the software.

Overall, I was impressed with Nucleus. It does not claim to be a total solution to program development on the micro-computer, but it certainly offers a practical and satisfying method of developing bug-free programs for a variety of tasks. Although the manual states that Nucleus can be used by someone without programming knowledge, any experience in program development must be an advantage in planning a system, its files and reports.

In functions such as file handling, linking data and constructing reports, Nucleus has many features offered by some of the sophisticated database products. Nucleus has the added benefit of automatically developing a menu system around itself, which means that the end user of a generated application needs no knowledge of Nucleus to operate the system.

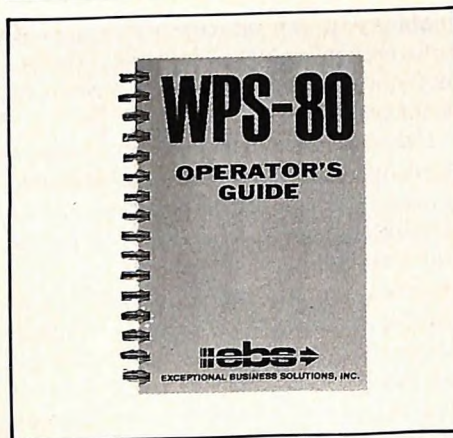
Compact products are available on CP/M, MS-DOS and concurrent CP/M-86 based systems. They also come with an interfacing module, which allows the extraction of data from the

Compact applications files (both standard accounting and user-generated), to a variety of well-established software products including dBASE2, WordStar Visicalc Lotus.

Nucleus itself won the RITA Software Product of the Year award in Britain last year, which I believe it deserves.

— Peter van Zwieten

Peter van Zwieten is a senior information systems consultant with Ernst & Whinney Services, Sydney



Speed and simplicity

WPS-80

This Word-Processor package is a pleasure to use. Digital Equipment Corporation (DEC) for many years has had as its top-of-the-line word processor a package called WPS-8. This package runs on the DECmate II and III systems and is dedicated in part to specialist high-output office word processing. As a user of WPS-8 and a former owner of a DECmate II, I was extremely happy with the software but constrained by

FACT FILE

Product: WPS-80

Price: \$495

Requirements: DEC Rainbow 128K, two disk drives or one hard disk, CP/M.

Documentation: Good

Skill level: Novice

Supplier: Chatswood Digital Centre
(02) 419 7588

the general lack of software for the machine.

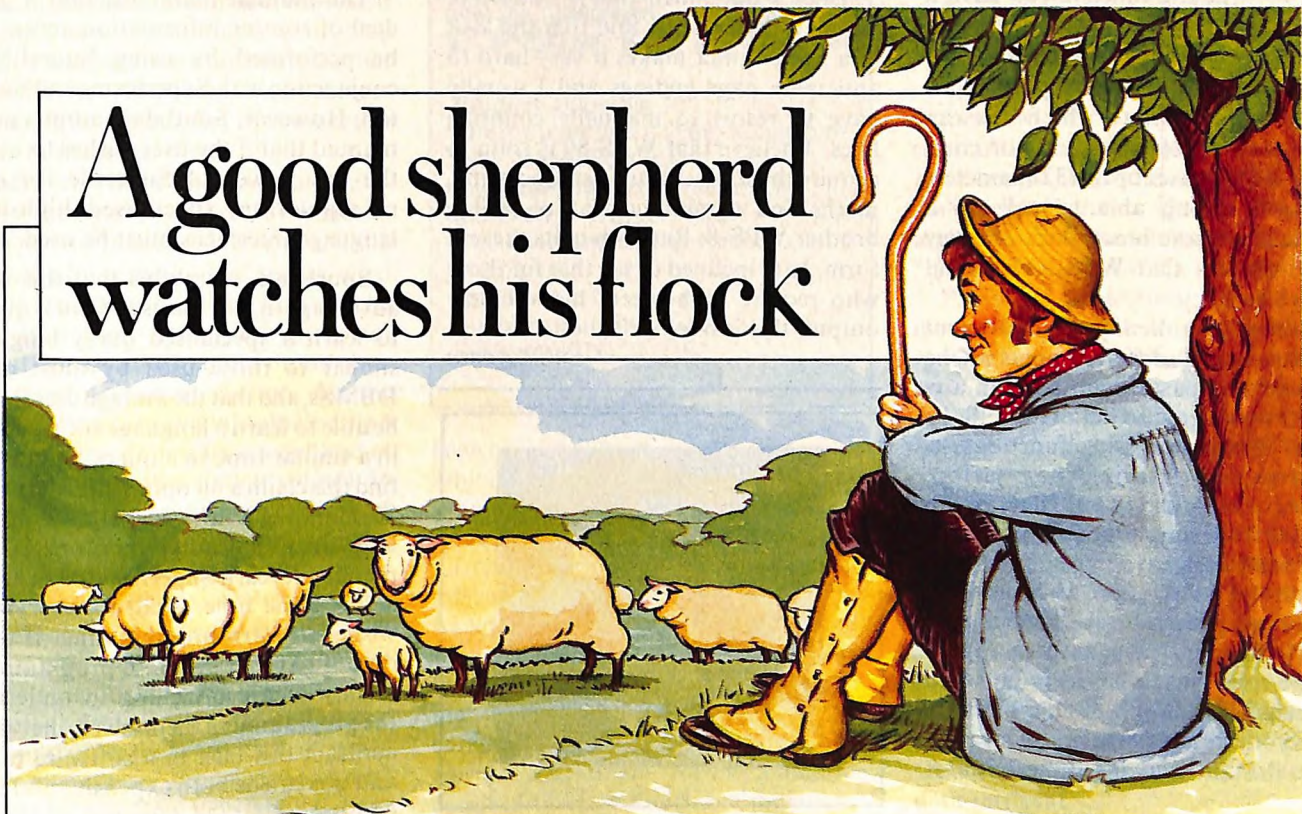
This has been rectified by the production of WPS-80, a CP/M version of WPS-8 that runs on the DEC Rainbow. The program is produced by Exceptional Business Solutions of California and is almost identical in operation to the DEC WPS-8 program. WPS-8 retails in Australia for \$495.

The main reason I like the package is that what you see is what you get — on-screen underlining and bolding, no visible control characters, a nice clear screen with no clutter, it is logical and easy to use, and has many unique features designed to speed output. Like the WPS-8, its use revolves around program-defined special keys that carry out dedicated word-processing functions. For the DECmate II these functions are etched into the keys for the user to see.

For WPS-80 the special functions are supplied as stick-on labels for the normal Rainbow keyboard. The key stick-ons are either red or green. The top left-hand corner of the numeric key pad is a completely red key with no label and is probably the most important key, because it is used to activate secondary functions of other keys labelled in red — for example, pressing the red key, then the M key which is labelled "Menu", activates the Menu; similarly the red key, then the R key activates the "ruler". The functions printed in green activate immediately the key is pressed. All the keys of the numeric key pad are instant function keys. The instant functions are the ones most commonly used in word processing — deleting words, deleting characters, underlining, bolding, cut and paste, centring and others. The cursor is activated by the cursor keys or by the green instant function keys for coarse movement between words and sentences.

The custom keyboard layout undoubtedly is one of the main reasons for the tremendous efficiency of WPS-80, but the program incorporates many other unique features. For example pressing the red master key then one of the green instant function keys will reverse the operation of that key — "Red" "Bold" will erase bolding. The help function is the essence of simplicity. Pressing the keyboard help key will give the help information for the function

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being used at the time. If you have a mental aberration in the middle of a cut and paste, assistance is only a "help" key away. WPS-80 incorporates 10 user-definable keys to which you can attach a string of commands or commonly used phrases up to 132 characters in length. Being able to call up a complete address block with one key press indicates that WPS-80 is about typing efficiency.

By the same token, you can also cut out and save 10 different areas at the one time and paste them back in any order. I won't go into detail over all the normal word processing functions — subscript, superscript, pagination, hyphen, push-pull — but they are all available from simple menu commands.

WPS-80 does have two simple functions that I have often wished for in other word processors — a calculator and a typewriter. Have you ever wanted to type one envelope from a word processor? With WPS-80 in typewriter mode, your keystrokes are sent straight to the printer, and it's done without fuss.

There's not much that I don't like about WPS-80 but I find that the lack of a line counter makes it very hard to anticipate page endings and I usually have to resort to manually counting lines. I believe that WPS-80 is soon to acquire the sophisticated list processing, maths and communication of its big brother WPS-8. But even in its present form, I am inclined to say that for those who require high-speed, high-volume output, this is one of the best.

— Geoff Warrener



Mixed blessings

Superfile 16

To anyone perusing the pages of computer magazines it must seem that each new issue brings yet more database management systems (DBMS). All claim to have more advanced features, to be easier to use and to be more efficient. To complicate matters further, most programs, old and new, are often so difficult to learn and use that the task of finding one suitable for your application can be most frustrating.

Superfile 16 is a relational DBMS. Although it may be used as a stand-alone package or in conjunction with two of Southdata's add-on products, Supertab and Superforms, it is primarily designed as a core program — that is, as a utility that should be interfaced with high-level languages such as C, Cobol, Pascal, Basic etc. Once Superfile is loaded it sits in memory until it is called. It is in this ability to be accessed by a high-level language that Superfile's power lies.

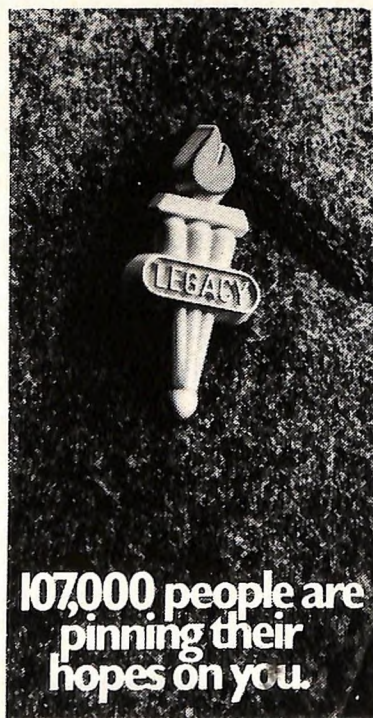
The manual maintains that a great deal of routine information access can be performed by using Superfile in conjunction with Superforms and Supertab. However, Southdata admits in the manual that if the user wishes to utilise the full power of Superfile for data manipulation, specialised high-level language interfaces must be used.

Southdata maintains that this is an advantage in that the user is not required to learn a specialised query language similar to those used by most other DBMSs, and that the average user should be able to learn a language such as Basic in a similar time to a query language. I find this claim a bit optimistic as efficient file handling is not easy to master in any language, especially when one is also required to learn Superfile's file structure at the same time. And not everybody wishes to learn programming. If users do not have an in-house programming facility or are unwilling to undertake the programming themselves, they must contract this task to a software house and this can be both expensive and time consuming.

Superfile keeps all records as lightly encrypted ASCII characters in a single file. A record is made up of a number of items, which consist of a tag (similar to a variable's label) and its associated value (the data). The values, or fields as they are more usually called, have variable length. This is a valuable feature that reduces the overhead needed for data storage. Each record is then delimited by an end-of-record marker (EOR). Record structure is loose, enabling new tags to be added to the database whenever the user needs to add a new field via the Look command.

Two indexes are maintained, one sequential and the other a B-tree. These indexes are automatically updated whenever a record is updated, and this creates heavy disk activity. Data input can therefore be rather slow on machines with slow disk drives. Further, as all tags are indexed automatically, there is a large overhead that can sometimes create indexes as large as the database itself (Southdata plans to release an updated version in which the user will be able to disable indexing on selected tags).

There is no delineation between numbers and ASCII character strings in data storage — numbers are not



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stored in the more common compressed floating-point format. Items containing numeric characters are indexed as either numbers or ASCII text characters depending on the number of consecutive letters in the item.

There are three methods of maintaining the database: Look, Cforms and through a user-designed interface. Look is essentially a method of seeing what data is stored within the database and what tags there are. Look does not format the data output, but dumps it to the screen a page at a time. All the search options are available including a Soundex algorithm (this is a method of finding words with a similar sound). In fact, if the user is experienced and wishes only to quickly input or peek at some data, Look provides fast access.

The second option is Forms. With this option, data is displayed and input with a user-designed form. Control-character sequences are used to move the cursor around the form and to end data entry. I find the use of these Control-character sequences annoying; the IBM's function keys should have

FACT FILE

Product: Superfile 16
Price: Superfile 16 \$668, Superform \$261, Supertab \$261
Requirements: 128K minimum, MS DOS, two disk drives
Documentation: Ring-bound, about 100 pages
Skill level: Intermediate
Supplier: Sunshine State Scientific Systems, (076) 35 3362

been utilised. This highlights Superfile's 8-bit origins. Data storage and retrieval is limited to a single page/screen.

The third method of data access and retrieval is through a user-designed interface. It is with this method that Superfile displays its full power. Several screens could be designed and accessed from within a program written in a high-level language (this would overcome the single page limitation of Forms) and these "forms" could be accessed through a series of menus.

With all three data entry methods data entry is slow, taking up to 30 seconds for one page of input.

The Soundex algorithm is a good feature and will be useful for those who constantly deal with aural information. For example, if the user inputs "HAWK" and does a Soundex search, "HAWK" and other like-sounding names such as "HAUK" and "HAWKE" will be found.

Password protection is not implemented on Superfile 16, and Southdata recommends that you remove Look and Cforms from the working database disks, thus limiting access to the database. With a high-level language implementation, however, the programmer should be able to provide adequate password protection.

Data integrity does not appear to be a strong feature. Throughout the manual there are dire warnings on the consequences of a system crash during some operations. The manual indicates that the indexes may become corrupt, and if this happens the user is advised to send the data disks to Southdata for data retrieval.






" Every now and again a computer program comes along that revolutionises the way we look at computers. VisiCalc was one, Lotus 1-2-3 another. Now along comes My Office " - Sydney Morning Herald, 08/07/85

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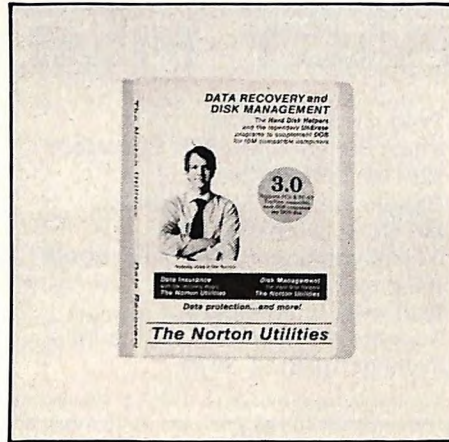
Southdata claims that fields can be indexed in the following times:

Records	Time
0-25	.2 sec
25-625	.4 sec
625-15,625	.8 sec
15,625-390,625	1.0 sec

The documentation with Superfile 16 is inadequate. Information is difficult to find and poorly explained. Insufficient detail is given on interfacing the package with high-level languages, so a programmer will need to spend considerable time experimenting with the package before being able to unleash its full power.

Superfile is essentially a programmer's tool. Its variable field length will be of great benefit in applications where total flexibility is required, but the need to interface the program with programs written in another language is a mixed blessing. It does, however, provide Superfile with a degree of flexibility probably unmatched by any other database program.

— Ron Newton



Norton improved

Norton Utilities v3.0

When this magazine reviewed the previous version of the Norton Utilities, it was described as a must for the serious computer

user. The same holds true for the recently released version III. With this release Peter Norton has shifted the emphasis of the utilities away from the computer hacker and towards the business and computer professional. This is not to infer that there are now limitations to the utilities. On the contrary, the utilities are both more versatile and easier than ever to use.

The Norton utilities version III comprises a suite of 16 programs. Of these, six are new, the remaining 10 comprising programs from Version II which have been improved and integrated into logical sub-suites. Only two programs from Version II, Clear and Bload, have been excluded.

Improvements to the Norton utilities include a far smoother integration with the Disk Operating System (DOS) so that they should now interface with all current versions of DOS and therefore with all DOS computers. Full support is available for the PATH command, and general overall technical improvements have led to much smaller and smoother-running utilities.

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BENCHTESTS

NU (Norton) is the main program and perhaps the most valuable of all the utilities. Norton is a fully menu-driven utility that gives users complete access to their disks. With this utility, the user can view and modify data selectively by file or by sector including the File Allocation Table (otherwise known by the unkind acronym FAT) and the Directory.

NU combines a number of utilities from Norton II and wraps them up in an integrated package. Users can map the entire disk space and see the location of any bad sectors and conflicting file allocations. These occur when, due to some hiccup, DOS thinks parts of two files occupy the same physical space on the disk. Users can also look at a disk map showing the physical location of individual files, look at the contents of those files in both hexadecimal and in ASCII (text) format, and even change the contents of those files. The program works on floppies, 10 and 20 megabyte hard disks and AT format hard disks.

Finally, Norton contains the UnErase utility which allows the user to unerase text files that have been corrupted or erased. The procedure is fairly straightforward, with the program prompting the user all the way. First the program displays a list of the erased files which it can identify. You have to select a file and supply the first letter of its name. Norton will then tell you if it looks likely that you will be able to recover the entire file or not.

Next you have the choice of letting Norton make an educated guess as to which disk sectors contain the file's data, or you can select the likely sectors one by one, look at the contents of each of those sectors to see if it is relevant, and then add them to those you have already "collected". The last step is to write the data to disk.

The other programs supplied are:

BEEP: Sounds the computer's speaker. This routine is useful for telling the user when a process has terminated or when an input is required during BATCH operations.

DS (Directory Sort): Sorts files within a directory into a specified order. The options are: Name, Extension, Date, Time and Size. Multiple selections are permitted and the path command is supported so that you can sort a directory by name without having to log into it first.

FACT FILE

Product: Norton Utilities, Version III
Price: —
Requirements: 128K memory, MS-DOS system
Documentation: 68 page booklet
Supplier: PC Extras, (02) 43 4322

DT (Disk Test): Reads every sector of a disk and reports which parts cannot be read successfully. There are two options: disk and file. Disk tests the whole disk, sector by sector, while the files option tests by files and maintains a running report of its findings.

FF (File Find): Lists the occurrences and directories in which nominated files are located. This program is invaluable in locating multiple copies of a file when tidying up a hard disk. Also invaluable when you know a file is on the hard disk, but aren't sure where it is.

FA (File Attributes): Display and/or alter a file's attributes. This allows a file to be hidden and write-protected to prevent accidental erasure.

FS (File Size): Displays the size of a file or group of files.

LD (List Directories): Lists all the directories and sub-directories on a disk.

LP (Line Print): Is an elementary print formatter.

SA (Screen Attributes): Allows the

user to reset the screen colors and screen default attributes. This allows the user to set the screen colors to any favored combination.

SI (System Information): Displays information such as BIOS version, peripherals and amount of memory. This program also performs an elementary test, returning a performance rating relating to the IBM PC's performance. The faster the computer and its disk, the higher the index rating returned. The IBM PC with floppy disks has a rating of 1.0, while the Canon A-200, also with two floppies but with an 8086 processor, returns a 1.1 rating.

TS (Text Search): Searches through a file, a group of files or the whole disks for an ASCII character string. When the selected piece of text is found, the user may write the selected text and any surrounding it to a text file.

VL (Volume Label): Writes a volume label to the disk. Labels may include lower case characters.

Wipedisk: Wipes all data from the disk. Valuable for removing all traces of sensitive files. The Wipedisk process is more effective than reformatting for destroying the contents of sensitive files.

Wipefile: Wipes all data from a file and replaces it with "00", known in computers as a "null character". Good for eliminating the contents of sensitive, erased files.

The Norton Utilities will work with a number of IBM incompatibles including the Texas Instruments Professional, the

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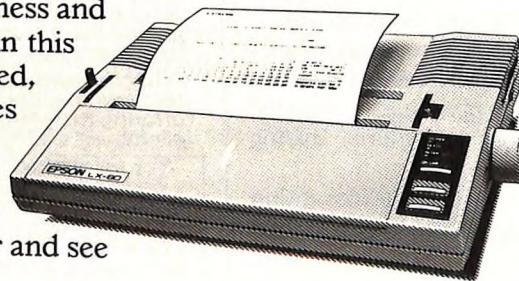
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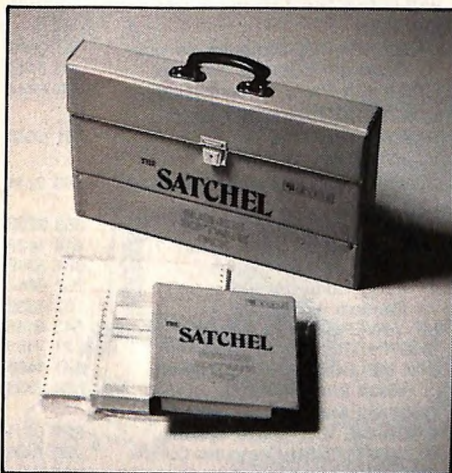
BENCHTESTS

Wang PC and the NEC APC-III, though in some cases a special procedure has to be followed before running any of Norton's programs. NU also works under TopView and the small but very concise manual gives all the details necessary for installing the others.

When the Norton Utilities Version II was reviewed in this magazine almost 12 months ago, it was described as being the computer user's equivalent of a pair of pliers and a screwdriver. Now it is more like a Swiss Army penknife. And just as useful.

PS: For the technically inclined, Version III of the utilities was written in LATICE C and compiled on version 1.04 of the Microsoft compiler. Linked into the compiled code are a number of assembler routines to access DOS and the BIOS. These routines were assembled with the aid of MICROSOFT's MACRO assembler version 1.27. The C source code was about 20,000 lines long and the assembled source code about 3000 lines.

— Ron Newton



Flexibility in the bag

Satchel

It is refreshing to work with a suite of software designed to meet the practical requirements of small business. The Satchel business software pack released by Abacus Software should prove popular with professional and commercial users. It is simple to

operate, and has speedy input and comprehensive, powerful management reports.

The package consists of fully integrated modules for order entry/invoicing, accounts receivables, stock and sales. Accounts payable and general ledger are stand-alone modules. Any data entered via the integrated modules will automatically update any other module in the integrated group.

The stand-alone modules can be kept open at month's end, while the integrated modules can be closed off, promptly as required. The general ledger is updated by posting summaries of the stock, sales and accounts payable entries provided by the monthly reports from those modules.

All modules in the system run on line, so once a transaction is input and accepted it is immediately written to a disk file and the system updates itself. All output reports are printed in background, thus freeing up the screen for the next task. All reports are time and date-stamped, provided the system the package is running on has a real-time clock.

An interesting feature of the software is the ability to scroll forward or backwards through the various data files when doing a screen inquiry of debtors, sales, creditors, stock or general ledger balances. This feature underlies the use of alphabetic name codes for customers, stock and creditors.

The software is written in BBASIC, a language and operating system that is capable of multi-user and multi-tasking facilities. At present the software runs on PC DOS, MS DOS, Xenix or Concurrent CP/M. It will also run on stand-alone machines where BBASIC has been implemented as an operating system. In this case you can take full advantage of the multi-user facility of BBASIC and run, say, two terminals at the same time on the one machine.

I have been working with the software installed on a Century microcomputer, using BBASIC as the operating system, with a 10-megabyte hard disk drive, two 720K floppy drives and two screen terminals run off the one machine.

The software is fairly straightforward to install and the manual sets out the procedures. Utility programs are provided for customising the screen and printer, creating and expanding the data files and setting the opening invoice

and credit note numbers and date format. A utility is also provided for the maintenance of identification and passwords, including the setting of security levels and their expiry date. A file parameter report in the manual shows the default values for the various sizes, and the disk drive number. The only other indicator to be set is the type of drives on your system — hard or floppy disk.

Once the system is running, you are confronted with the main menu, which lists eight options, comprising the six modules, the utilities and the exit option. Selection of the particular task function will introduce the sub menus related to that module. A "walk through" the menus quickly gives you an overview of the facilities available, and the consistent approach adopted in data entry screens and operator prompts. This speeds up the familiarisation process and minimises reference to the manual.

The order entry/invoicing module provides for the maintenance of sales tax, commission and salesmen codes, and retail and wholesale invoices. There is a facility to enter credit notes with or without stock update.

Entering of invoices/credit notes is very simple. Using the "click" feature of the software, you type in the alpha customer code, which then displays the customer name and current aged status of their account at the bottom of the screen. If accepted, the system immediately displays the full name and billing address on the screen.

Inputting product code displays the product description together with "on hand" and "on order" quantities of the product. Upon acceptance, the product description is inserted.

Once input of all items is completed, the invoice is totalled by typing "end". The program runs in the background and the screen is returned for the next entry. The invoices and credit notes are then accumulated in a printing file that can be printed at any time.

The first option of the accounts receivable module enables maintenance and screen inquiry of a customer's data. The four sub-options are add, delete, modify or view a customer's details.

Customer data maintained apart from name, address, phone number and aged balances includes customer type, representative code, statement code (0 = statement required, 1 = no statement

BENCHTESTS

FACT FILE

Product: Satchel
Price: \$895
Requirements: MS DOS, PC DOS 2.0, 128 K, 2 disk drives
Documentation: Manual with 10 loose-leaf inserts
Skill level: Medium
Supplier: Amust Computer Corp, (03) 555 3644

required), price code, sales tax number, date, amount and reference of last transaction, and year-to-date sales value — quite a profile on your customers. The screen input layout in the manual is an ideal form for collating your client information for the initial loading of the data.

The second option of the module enables the input and screen inquiry of transactions. To add new transactions, simply select the transaction type (invoices, credit notes, cash receipts, journal debits and journal credits) and input the customer's code. Immediately the customer's current account aged balance status is displayed.

Output reports from the system are quite comprehensive and include the facility to select full report, or report in respect of individual customers or ranges of customers. Customer labels are available by customer type or for all clients.

The accounts payable module is similar to the accounts receivable module in reverse — a stand-alone module not integrated with the other five. Output reports in addition to the manual items from such a system include a creditor remittance, cash requirement report (for all, individual or a range of creditors) and a listing of cheques drawn.

The sales module provides summary screen inquiry of transactions and output, summary reporting on sales in product or customer sequence, sales by product and profits.

The stock module provides very powerful management reports to assist control of inventories. Reports include stock summary and detailed report by product group or all categories, stock labels, re-order level report, stocktake forms, stock variance report, price list, stock movement report and stock transaction report by all transactions or by input source. Quantities as well as value are reported.

The general ledger module gives a small business a facility to keep track of its operational efficiency, via the profit and loss and balance sheet reports. The general ledger for the trading company, trust, sole trader or partnership has a maximum of 500 accounts available, which should be ample in most instances. The chart has been broken up into logical groups, such as capital and reserves, assets, liabilities, manufacturing statement and profit and loss.

Extra accounts can be added between existing account numbers, but no modification of the existing account structure is possible. No deletions are possible if transactions are present for that account or if it has a balance in it. Transaction input is available from receipts, payments, bank statements, general journals and budgets. The maintenance sub-menu allows full functions for any account in the chart of accounts.

Output reports are quite comprehensive and printed in dollars and cents or whole dollars. Reports include trial balance, the general ledger (available for an individual account, all, or a range of accounts), budget comparison, chart of accounts listing, manufacturing statement, trading statement, profit and loss, balance sheet and worksheet. You can produce reports showing balances for the year, current month, last month, or two months ago. Balances are stored and updated when month end close operation is run. The package will not allow the printing of reports unless the pre-processing routine has been run; and a profit and loss must be run to produce a balance sheet.

The Satchel package does not come with any backup programs, so the installed operating system utilities are used. A list of files to be backed up is provided in the manual. The manual is logically laid out, concise and easy to read, and there are sufficient explanations for the first-time user.

The Satchel package comprises 180 programs, and sells for \$895 (excluding tax). Improvements could be made to some of the modules, and minor bugs and error trapping in the programmes need to be cleaned up. But it is good value for money, considering its flexibility and its facilities.

— John Gianchino

John Gianchino is a Melbourne chartered accountant.

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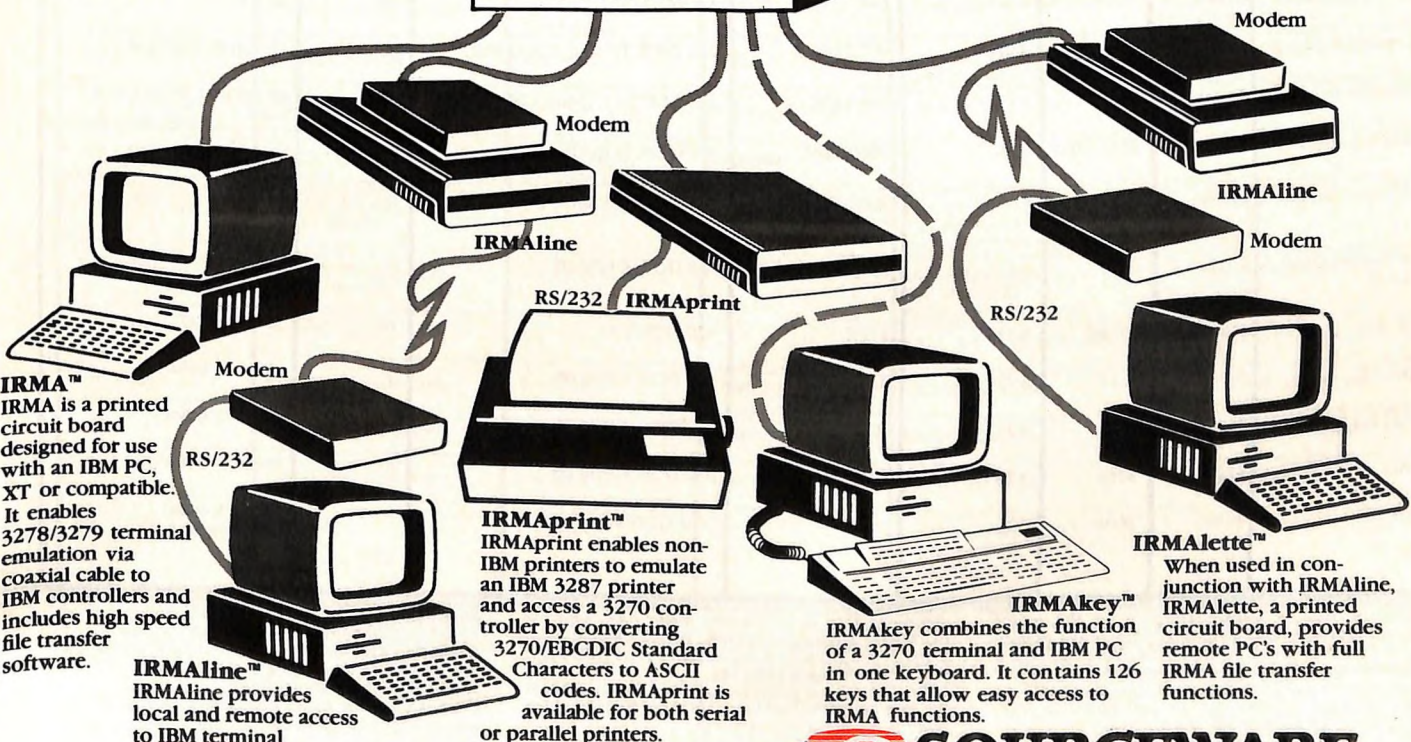
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Apple IIc	\$1795	65C02	1.0	128K	ProDOS, DOS 3.3, Pascal 1.2	Nil	Monitor, TV, flat screen
Apple IIe	\$2095	65C02	1.0	64/128K	ProDOS, DOS 3.3, Pascal 1.2	7	External monitor
Apple Macintosh	\$3295	68000	8.0	128/512K	The Finder, CP/M 68000	Nil	High res b/w
Apricot PC	\$5305	8086	5.0	256/720K	MS DOS 2.0, CP/M	2	9" or 12" green
Apricot Portable	\$5645	8086	5.0	256/720K	MS DOS 2.11, Conc. CP/M 86	1	80 x 25 LCD
Apricot XI	\$7905	8086	5.0	256/720K	MS DOS 2.11, Conc. CP/M 86	2	80 x 25, 9" or 12"
Apricot F1	\$3385	8086	4.77	256/720K	MS DOS 2.11, Conc. CP/M 86	2	80 x 25
Apricot Point 7	\$10,165	8086	4.77	512/1024K	Concurrent CP/M	3	80 x 25
AWA Corona	\$3893	8088	4.77	128/640K	MS DOS, CP/M 86, REVELATION	4	80 x 25
AWA Corona Portable	\$4182	8088	4.77	128/512K	MS DOS, CP/M 86, REVELATION	4	80 x 25
Bondwell 14	\$2295	Z80A	4.0	128K	CP/M 3.0	Nil	9" amber
Canon AS-100	\$7250	8088	4.0	128/512K	MS DOS, CP/M 86	3	30 cm mono or color
Challenger	\$2990	8086	4.77	256/640K	MS DOS, CP/M 86	5	Separate
Commodore PC10	\$3700	8088	4.77	256/640K	MS DOS	5	12" green
Compaq Portable	\$4860	8088	4.77	256/640K	MS DOS	3	80 x 25
Epson PX-8	\$1469	Z80A	2.5	64K	CP/M 2.2	Nil	80 x 8
Epson QX-10	\$2750	Z80A	4.0	192/256K	MS DOS, TP/M II, CP/M 80B	N/A	12" green high res
Ericsson PC	\$4999	8088	4.77	256/640K	MS DOS 2.11, Conc. CP/M 86	6	30 cm 80 x 25 amber or color
Grid Compass	\$5315	8086, 8087	N/A	256/512K	MS DOS, Grid-OS	Nil	80 x 25 electroluminescent
HP Touchscreen II	\$6138	8088	8.0	256/640K	MS DOS, CP/M 86	2	12" 27 x 80
HP Touchscreen Max II	\$10,770	8088	8.0	256/640K	MS DOS, CP/M 86	2	12" 27 x 80
HP 110	\$4834	80C86	5.33	272K	MS DOS 2.11	Nil	16 x 80 LCD
IBM PC	\$4789	8088	4.77	128/640K	PC DOS, CP/M 86	5	Mono or color
IBM PC Portable	\$4233	8088	4.77	256/640K	PC DOS, CP/M 86	5	Mono or color
IBM XT	\$7599	8088	4.77	256/640K	PC DOS, CP/M 86	5	Mono or color
ICL M6	\$4399	8088	5.0	256K	MU-CCP/M	3	12" 24 x 40/80 green/reverse

This is our exclusive listing of all the major specifications and prices of the main micro-computers available in Australia. No doubt we've omitted some; to them we can only apologise and say that if you send us a specifications sheet with the relevant information, or call direct on (02) 235 6651, we will remedy the omission.

Price: Price is based on the cost of a machine with two disk drives (where applicable), monochrome screen and minimum memory. In the case of CP/M

machines this will normally mean 64K, and for PC/MS DOS equipment 128K. Where the minimum memory for a machine is 256K, the price will reflect this. Prices include sales tax.

CPU: The central processing unit is the chip that is the "brains" of the machine. This column tells which one the machine normally has.

Speed (MHz): The speed at which a computer can do a job is partly a measure of how fast it runs. This column gives the speed in megahertz.

Min/Max memory: The minimum and maximum amount of memory the system can maintain.

Operating system: All the operating systems that will work with the standard machine or which are supplied by the manufacturer.

Expansion slots: Many computers have slots into which specially designed circuit boards can be inserted, to extend the machine's capabilities. This shows how many, if any, a machine possesses. It does not state what shape plug they take, or how



Resolution (pixels)	I/O ports	Disk drives	Hard disk	Software	Comments
N/A	2 serial, 1 parallel	2 x 800K 5 1/2"	Opt ext 10Mb	WP, Supercalc, account, project, database	Computer in a case. Multiple disk formats
560 x 192	2 serial, mouse i'face	1 x 140K 5 1/4"	Optional	20 hours of tutorial on disk	Apple's first portable. LCD screen available
560 x 192	1 parallel, 1 serial	1 x 140K 5 1/4"	Optional	ProDOS users disk tutorial	Price is for starter system
512 x 342	2 RS-422/RS-232	1 x 400K 3 1/2"	Optional	Tutorial, MacWrite, MacPaint	Tomorrow's computer today
800 x 400	RS-232, Centronics	Up to two 720K 3 1/2" floppies	5 or 10MB, Xi model	Communications, SuperCalc, SuperWriter, etc.	Keyboard microscreen runs most IBM software
640 x 200	Centronics, RS-232	720K 3 1/2" diskette	10Mb optional, external	Diary, SuperCalc, SuperPlanner, SuperWriter	Infrared link to keyboard, mouse, voice commands
800 x 400	Centronics, RS-232	720K 3 1/2" diskette	5 or 10Mb	Diary, SuperCalc, SuperPlanner, SuperWriter	Microscreen on keyboard
640 x 256	Centronics, RS-232	720K 3 1/2" diskette	5 and 10Mb optional	Diary, SuperCalc, SuperPlanner, SuperWriter	Aimed at first-time user
640 x 256	Centronics, RS-232	720K 3 1/2" diskette	10Mb	Diary, SuperCalc, Con-DOS, SuperPlanner, SuperWriter	Intended as cluster controller for network
640 x 325	1 RS-232, 1 Centronics	1 or 2 x 360K	10Mb (optional)	GWBasic, Multimate	REVELATION emulates the Pick system
640 x 325	1 RS-232, 1 Centronics	1 or 2 x 360K	10Mb (optional)	GWBasic	REVELATION emulates the Pick system
N/A	Centronics, 2 x RS-232	2 x 360K	No	WordStar, CalcStar, DataStar, ReportStar	A good, cheap, lightweight portable
640 x 400	Centronics	2 x 360K	10Mb (optional)	WordStar, CalcStar, InfoStar	A bit slow. Wide range of software
640 x 200	RS-232, Centronics	2 x 360K 5 1/4"	Optional	GWBasic, Perfect: Filer, Calc, Writer	Screen not included in price
640 x 200	Parallel, serial	2 x 360K	10Mb (PC 20)	GWBasic, MS DOS, DOS explained	Commodore's entry into the IBM-compatible market
640 x 200	Parallel, serial	360K	10Mb (optional)	—	The best-selling portable IBM clone
N/A	RS-232, analog to digital	Microcassette, RAM disks	No	CP/M utilities MBASIC	Portable WordStar, diary available
640 x 400	Parallel, RS-232	2 x 320K	10Mb (optional)	WordStar, Mailmerge, SpellStar, graphics	Price includes Epson FX-80 printer
640 x 400 mono, 640 x 200 color	RS-232, Centronics	2 x 360K	10Mb (optional)	GW BASIC, Tutorial	Three-year warranty
320 x 240	RS-232/RS-422, IEE-488	384K bubble, ext 360K floppy	Optional	Nil	—
512 x 390	RS-232, RS-232/422, HPIB, HP-HIL	2 x 710K 3 1/2"	15Mb optional	MemoMaker, Card File, Personal Application Manager	Touchscreen masks how good a machine this is
512 x 390	RS-232, RS-232/422, HPIB, HP-HIL	1 x 710K 3 1/2"	15Mb	MemoMaker, Card File, Personal Application Manager	Touchscreen masks how good a machine this is
128 x 480	RS-232, HP-IL	3 1/2" 710K	No	PAM, 1-2-3, MemoMaker, Terminal	Lightweight portable, software in ROM
320 x 200	Purchased separately	2 x 360K 5 1/4"	10Mb (optional)	BASIC, BASICA	The one that shaped the marketplace
640 x 200	Purchased separately	1 x 360K 5 1/4"	10Mb (optional)	BASIC, BASICA	An IBM PC shoe-horned into one box
640 x 200	Purchased separately	1 x 360K 5 1/4"	10Mb	BASIC, BASICA	Hard-disk IBM PC
640 x 400 color optional	2 RS-232	2 x 764K	No	Multi-user, MS DOS, CP/M, CCP/M, Personal Basic	—

many might be free after essential peripherals, such as print interface cards and graphics cards, have been inserted.

Screen: Shows the type and size of the standard display screen. Where the screen is not supplied with the machine, this is shown.

Resolution: The clarity of the picture on the screen is a function of the number of pixels it has, pixels being the tiny dots that the computer turns on and off to put together a screen image. This column

shows the number of pixels. The horizontal measure comes first, followed by the vertical count.

I/O ports: I/O is short for input/output. Essentially it lists what connectors come with the machine for communicating with such devices as printers, modems, etc.

Disk drives: This column shows the number of disks with a standard machine, plus the storage capacity.

Hard disk: Some manufacturers offer a hard disk as an alternative to one of the floppy disk units. This

column shows the capacities available.

Software: This column shows what software is supplied with a standard machine.

Comments: Special or unusual features.

All information is as supplied by the manufacturer or distributor. Every attempt has been made to ensure that the information is accurate, but Today's Computer takes no responsibility for errors or omissions. Nor will the magazine accept responsibility for any loss or liability that may result.

HARDWARE BUYERS GUIDE

Make/ model	Price	CPU	Speed (MHz)	Memory min/max	Operating system	Exp. slots	Screen
ICL M16	\$5999	8088	5.0	256K	MU-CCP/M	3	12" 24 x 40/80 green/reverse
ICL M36	\$8999	8088	5.0	512K	MU-CCP/M	3	12" 24 x 40/80 green/reverse
ICL M46	\$10,799	8088	5.0	512K	MU-CCP/M	3	12" 24 x 40/80 green/reverse
ITT Xtra	\$4250	8088	5.0	128/640K	MS DOS, CP/M 86	5	14" amber, green or color
Kaypro 10 Portable	\$4798	Z80	4.0	64K	CP/M 80	Nil	9" green screen
Kaypro 4	\$2838	Z80	4.0	64K	CP/M 80	Nil	9" green screen
MicroBee APC	\$2172	Z80A	3.75	64K	CP/M 2.2	Nil	Green 80 x 24
Morrow MD11	\$5820	Z80A	4.0	128K	CP/M 3.0	Nil	12" green 24 x 80
Morrow Pivot	\$3650	80C86	3.5	128/512K	MS DOS 2.1	Nil	16 x 80 LCD
NEC APC III	\$3565	8086-2	8.0	128/640K	MS DOS 2.11, UNIX	4	14" 25 x 80
NEC PC-8201A	\$695	80C85	2.4	16/32K	Proprietary	1	40 char x 8 lines LCD
Olivetti/AT&T M24	\$5030	8086	8.0	128/640K	MS DOS CP/M 86	7	25 x 80 green
Osborne 2100	\$3200	8088	4.77	256/640K	MS DOS 2.11	5	Purchased separately
Osborne 3	\$3792	80C86	3.5	128/512K	MS DOS 2.11	Nil	16 x 80 LCD
Osborne Executive	\$2950	Z80A	4.0	128K	CP/M 3.0	Nil	8" amber
Osborne Vixen	\$2850	Z80A	4.0	64K	CP/M 2.2	Nil	7" amber, 80 x 25
President 16-200	\$3900	8088	4.77	512/748K	MS DOS, CP/M 86	8	30 cm green, color 80 x 24
Sharp PC-2500	\$545	8-bit CMOS	N/A	5/21K RAM, 72K ROM	Proprietary 16K RAM card	Nil	4 x 25 LCD 150 x 32
Sharp PC-5000	\$3435	8088	N/A	128/256K	MS DOS 2.0	Nil	8 x 80 LCD
Sigma Elite PC	\$5999	8088	4.77	256/640K	MS DOS CCP/M	5	14" color RGB
Tandy M100	\$499	80C85	2.4	8/32	Proprietary	1	40 char x 8 lines LCD
Tandy TRS-80 Model 2000	\$4799	80186	8.0	128/768K	MS DOS	4 slots	80 x 25 mono or color
Tandy Model 4 Portable	\$1999	Z80A	N/A	64/128K	TRS DOS	Nil	80 x 24 mono
Tandy 16B	\$9999	68000 & Z80	6 & 4	256K/15Mb	TRS DOS, Zenix	4	80 x 24 green
Tandy 1000	\$1950	8088	4.77	128/640K	MS DOS 2.11	3	30 cm green or color
Telecom Computerphone	\$2950	68008	13.5	128K	Modified QDOS	ROM, RAM packs	9" mono or 14" color
Televideo TPC II	\$5140	8088	4.77	256/640K	TeleDOS, PC DOS	1	23 cm amber
Televideo PC	\$5710	8088	4.77	256/640K	TeleDOS, PC DOS	1	35 cm green
Televideo XT	\$7877	8088	4.77	256/640K	TeleDOS, PC DOS	1	35 cm green
TI Professional Computer	\$3995	8088	5.0	128/768K	MS DOS 2.11	5	12" mono or 13" color
TI Pro-Lite	\$6500	80C88	N/A	256/768K	MS DOS	2	80 x 25 LCD
Toshiba T1100	\$2995	80C88	4.77	256/512K	MS DOS, CP/M 86	N/A	LCD
Toshiba T1500	\$3950	8088	4.77	128/640K	MS DOS CP/M 86	3	Color monitor or LCD
Zenith Z100 PC	\$5395	8088/8085	5	192/768K	CP/M 2.2, MS DOS 2.11, CP/M 86, MP/M 86, CCP/M 86	5	30 cm green/amber
Zenith Z150	\$4995	8088	8	320/640K	MS DOS 2.11, PC DOS	7	30 cm hi-res amber



Resolution (pixels)	I/O ports	Disk drives	Hard disk	Software	Comments
640 x 400 color optional	6 x RS-232, 1 synch.	2 x 764K	Optional	Multi-user, MS DOS, CP/M, CCP/M, Personal Basic	Supports four intelligent terminals and printer
640 x 400 color optional	6 x RS-232, 1 synch.	1 x 764K	10Mb	Multi-user, MS DOS, CP/M, CCP/M, Personal Basic	Multi-user (four tasks)
640 x 400 color optional	6 x RS-232	1 x 764K	20Mb	Multi-user, MS DOS, CP/M, CCP/M, Personal Basic	Add-on intelligent workstations optional at \$1249 each
640 x 200	N/A	2 x 360K	Optional	BASIC, BASICA	ITT's entry into the micro world
N/A	1 parallel, 1 serial	1 x 400K	10Mb	WordStar, Mailmerge, CalcStar, dBase II etc.	One of the few portables with hard disk
N/A	1 parallel, 1 serial	1 x 400K	10Mb	WordStar, Mailmerge, CalcStar, dBase II etc.	Portable, real-time clock
512 x 256	RS-232, parallel	1 x 400K	External, optional	WordStar, Multiplan MBASIC	Australia's own low-cost CP/M system
720 x 288	2 x RS-232, 1 x parallel	1 x 384K	11Mb	New Word, SuperCalc, database, etc.	Fast hard disk, good value for money
480 x 128	RS-232, Centronics	2 x 360K	No	Appointments, Terminal Emulator, calculator	The 16-bit successor to the Osborne 1
640 x 400	Centronics, RS-232	2 x 640K	10Mb	Nil	High-grade IBM-compatible
240 x 64	RS-232, barcode, parallel	No	No	BASIC in ROM	Similar to Tandy 100, but more memory
640 x 400	Parallel, serial	2 x 360K or 720K	10Mb optional	No	Fast processor; M21 transportable available
N/A	RS-232, Centronics	2 x 360K	10Mb or 20Mb	Not decided	Osborne's first desktop
480 x 128	RS-232, Centronics	2 x 360K	No	Appointments, Terminal Emulator, calculator	The 16-bit successor to the Osborne 1
—	2 RS-232, 1 Centronics	2 x 200K or 400K	11.2Mb	WordStar, Mailmerge, SuperCalc, MultiLedger etc.	Development of the famous Osborne 1
640 x 240	RS-232, Centronics	2 x 390K	Optional, external	WordStar, Mailmerge, SuperCalc, Media Master etc.	Osborne's smallest portable. Multiple disk formats
640 x 704	1 RS-232, 1 Centronics	2 x 360K	Up to 20Mb	Perfect range, 1-2-3 or Open Access	IBM-compatible
150 x 32	Serial (extra interface needed to increase voltage), cassette interface	Nil	No	Basic spreadsheet, phone directory	—
640 x 80	RS-232	External	No	GW BASIC	128K bubble memory (opt), clip-on thermal printer
640 x 400	Parallel, serial	2 x 360K	Optional	Open Access, Basic	XT version available
240 x 64	RS-232, barcode, parallel	Optional	No	BASIC in ROM, dialler, diary, text	Probably the most popular lap portable
640 x 400	1 serial, 1 Centronics	2 x 720K	10Mb optional	Multiplan, Multimate, dBase II, BASIC	A formidable machine. Tandy's best
240 x 640	Parallel	2 x 156K	15Mb optional	Scritsit, PFS:file, PFS:Calc	CP/M compatible. Overpriced portable
N/A	2 x RS-232, parallel	2 x 1250K 8" floppies	15Mb optional	Operating system	—
640 x 200	Parallel, light pen	1 x 360K 3½"	Optional	O/S, Deskmate integrated software	Color graphics standard. Price does not include second drive or screen
256 x 512	1 RS-432	2 x 100K 3½"	No	Quill, Abacus, Archive, Easel, BASIC	Built-in phone, phone database, auto-answer
640 x 240	1 RS-232, 1 Centronics	2 x 360K	No	GW BASIC, TeleCalc, TeleWrite, TeleDBMS	Transportable with graphics
640 x 240	1 RS-232, 1 Centronics	2 x 360K	No	GW BASIC, TeleCalc, TeleWrite, TeleDBMS	Tilt screen desktop, optional color
640 x 240	1 RS-232, 1 Centronics	1 x 360K	10Mb internal	GW BASIC, TeleCalc, TeleWrite, TeleDBMS	Optional 20Mb, hard disk color
720 x 300	1 parallel	2 x 360K	10 and 20Mb (optional)	BASIC, BASICA	Better than the IBM, but not IBM-compatible
640 x 200	Parallel	2 x 156K	15Mb (optional)	Scritsit, PFS:File, PFS:Calc	—
640 x 200	Parallel	2 x 360K	10Mb optional	Basic, MS DOS 2.11	Lightweight IBM-compatible transportable
640 x 200	RBG, parallel, ext. floppy	1 x 720K 3½"	No	Basic, MS DOS 2.11	IBM-compatible lap portable. Eight-hour battery life
640 x 225	1 Parallel, 2 RS-232	2 x 360K 5¼"	10Mb optional	Lotus 1-2-3, CP/M, MS DOS	Expandable to 50 Mb. Lan & Multi-user options. Has S100 Bus.
720 x 350	1 parallel, 1 RS-232	2 x 360K	10Mb (optional)	MS DOS 2.11	Runs Symphony in base configuration. 25 cm Z160 portable version available

Accounting

DIYCAS

A simple accounting package with three modules.

Requirements: MS DOS or CP/M (128K RAM)

Supplier: Subiaco Accounting Software, (09) 381 4233

Price: \$820 for three modules

PICA

PICA is a sophisticated multi-user, multi-tasking, multi-company accounting system comprising general ledger, accounts receivable, sales order, accounts payable, purchase order, payroll, inventory, bill of materials, job cost and time cost.

Requirements: MS DOS, CP/M, CP/M-96, CCP/M-86, Xenix or Unix

Supplier: ATAC, (03) 662 2755

Price: \$7500 (\$750 per module, debtors \$1500)

TMAN

Tradesman accounting is an interactive menu-driven accounting system designed for plumbing and electrical businesses. It can be adapted for other businesses that hire out their labor on a fixed quotation or time and material basis.

Requirements: MS DOS, CP/M or CP/M-86

Supplier: ATAC, (03) 662 2755

Price: \$2500

PTA

Professional Time Accounting is designed for advertising agencies and public relations companies.

Requirements: MS DOS, CP/M, CP/M-86

Supplier: ATAC, (03) 662 2755

Price: \$1000

Financial

PAY-PACK

A payroll system designed for Australian business. The payroll is generated from the master information of each employee. Group certificates can be printed and all outstanding pay can be detailed at any time.

Requirements: MS DOS or CP/M

Supplier: Custom Made Software, (02) 399 8520

Price: \$590

Job Specific

SHARES

A system allowing public companies to maintain a share registry.

Requirements: MS DOS, CP/M or CP/M-86

Supplier: ATAC, (03) 662 2755

Price: \$14,000

MELBA

A system that allows organisations to keep track of membership details and the subscription status of their members.

Requirements: MS DOS, CP/M, CP/M-96

Supplier: ATAC, (03) 662 2755

Price: \$2000

MARKETPAC

MarketPac is a computerised sales and marketing system that enables salesmen to carry out an organised follow-up and to give sales management control.

Requirements: MS DOS

Supplier: Austin Associates, (02) 260 1782

Price: \$1300

MAINTENANCE CONTRACT CONTROL SYSTEM

This system provides management, service and accounts information on the status and history of service contracts.

Requirements: CP/M, MS DOS or TurboDOS

Supplier: Nucleus Computer Services, (03) 232 6733

Price: \$1950

CALL LOGGING SYSTEM

Allows entry of call details as they are taken from the customer and a worksheet is printed for the engineer. Work histories can be searched by contract number, worksheet number or name.

Requirements: CP/M, MS DOS or TurboDOS

Supplier: Nucleus Computer Services, (03) 232 6733

Price: \$1950

PREVENTATIVE MAINTENANCE SYSTEM

This system manages and schedules preventative maintenance for equipment.

Requirements: CP/M, MS DOS or TurboDOS

Supplier: Nucleus, (03) 232 6733

Price: \$1500

CLASS

The Computations Life Agents Support System addresses the requirements of life insurance agents and brokers. It handles superannuation and most other insurance.

Requirements: IBM PC or compatible

Supplier: Computations, (02) 925 2925

Price: \$2500

SACS

School administration and clerical system designed specifically for schools.

Requirements: Pick-based systems

Supplier: KSH Systems, (03) 267 2699

Price: \$14,000

Graphics

AUTOCAD 2

Release 2.1 of AutoCAD has been bundled with three extensions that offer advanced drafting features and 3D visualisation.

Requirements: Most MS DOS computers

Supplier: Entercom, (03) 429 9888

Price: \$3500 to \$4300

AUTO-ROUTER

A collection of software tools and circuit element templates that automate the

routing of traces on a double-sided PCB. It is designed to be used with AutoCAD.

Requirements: AutoCAD

Supplier: Technical Imports Australia, (02) 922 6833

Price: \$1740

PC PAINTBRUSH

A PC paint program that will work with most IBM PC color graphics cards and offers a choice of 14 fonts and a selection of input control devices.

Requirements: IBM PC or compatible

Supplier: Technical Imports Australia, (02) 922 6833

Price: \$250

Education

WAMSOFT

A series of mathematics programs for the BBC computer developed by the mathematics department of the WA College at Nedlands.

Requirements: BBC computer

Supplier: SRIA, (09) 325 7644

Price: \$40 each

OSPNEY

A wildlife conservation game to teach the challenge of wildlife conservation.

Requirements: BBC computer

Supplier: SRIA, (09) 325 7644

Price: \$45

Databases

POWERBASE

A multi-file, partly-relational DBMS designed for the non-programmer.

Requirements: IBM PC or compatibles

Supplier: Interactive Applications, (02) 920 1377

Price: \$795

Integrated Programs

JAZZ

An integrated program for the Macintosh that offers spreadsheet, word processing, database, graphics and communications. The HotView feature allows changes in one function to be automatically reflected in all other functions.

Requirements: 512K Apple Macintosh

Supplier: Imagineering

Price: \$795

Communications

MODEM 10

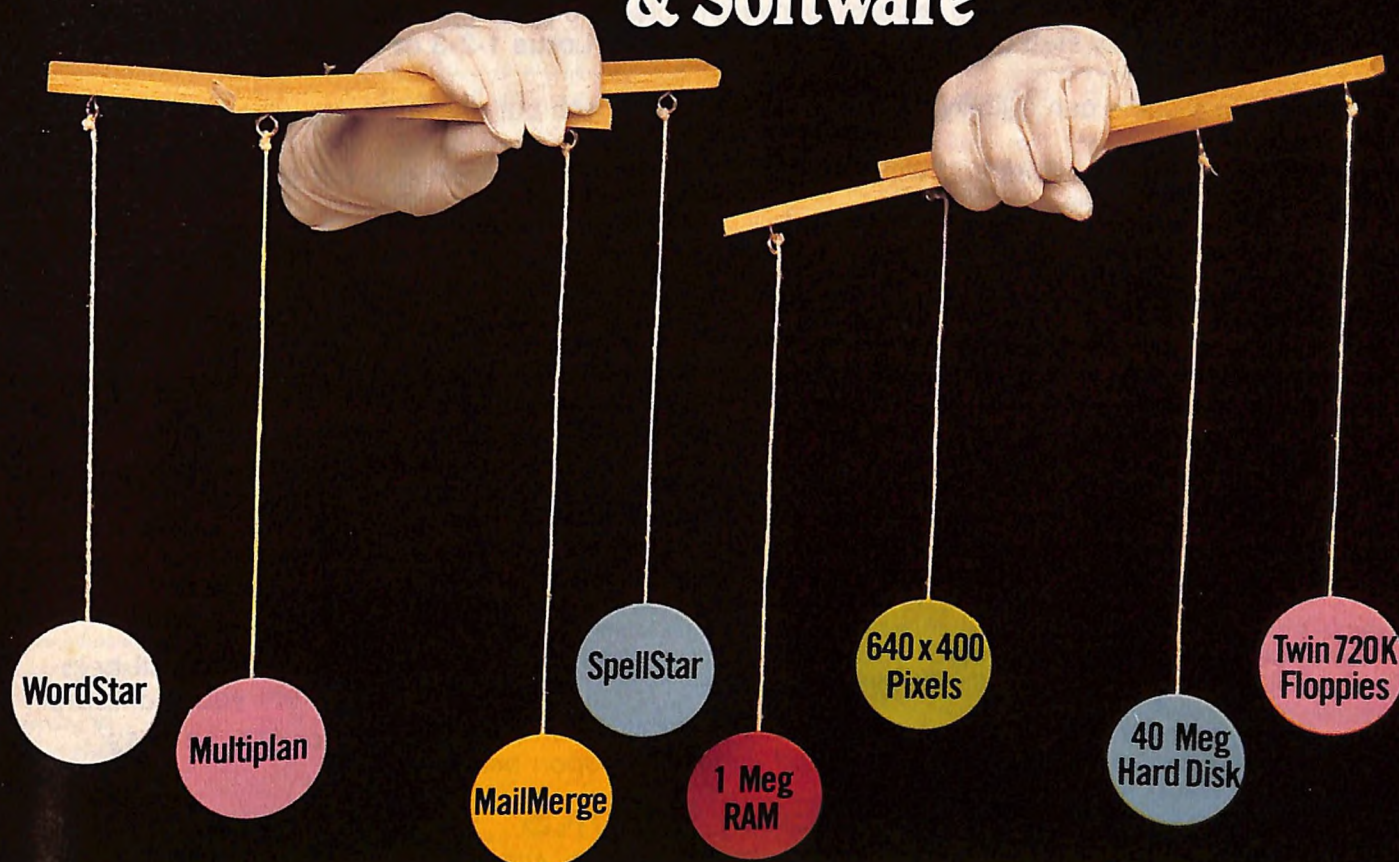
A public domain implementation of the popular communications program Modem 7 for the Cromemco C-10 computer. Source code is included.

Requirements: Cromemco C-10

Supplier: Applied Environmetrics, (03) 802 571

Price: \$25

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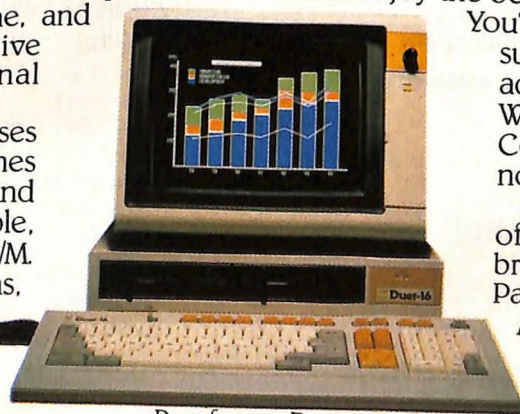
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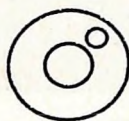


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COMING UP

Edited by Helen Grant
Computer shows, conferences and seminars here and abroad

Title	Date	Place	Organisers	Contact
Australia				
Forum '85	August 8-10, 1985	Hilton Hotel, Sydney	Australian Convention Management Services	Ph: (02) 29-1431
Ausgraph '85	August 12-16, 1985	Brisbane	Australian Computer Graphics Association	Ph: (03) 387-9955
Apcon '85	September 3-4, 1985	Masonic Centre, Sydney	PC Users Group	Ph: (02) 663-3919
Pan Pacific	September 10-13, 1985	Melbourne	Riddells Exhibitions	Ph: (03) 429-6088
Australian International Consumer Electronics Exhibition	September 21-27, 1985	Melbourne	Australian Exhibition Services	Ph: (03) 267 4500
IREECON '85	September 30-4, 1985	Melbourne	IREE	Ph: (03) 29-4051
Computer Expo '85	November 6-9, 1985	Brisbane	Robert Woodland Exhibitions	Ph: (07) 372 3233
Royal Institute of Public Administration Conference	November 13-15, 1985	Sydney	ACMS	Ph: (02) 29 1431
Online '86	January 20-22, 1986	Sydney	ACMS	Ph: (02) 29 1431
First Australian Software Engineering Conference	May 14-16, 1986	Canberra	Institution of Engineers	Ph: (062) 73 3633

Overseas

MachineAsia	September 23-27, 1985	Singapore	Nicolson Exhibition Services	Ph: (02)-267-1090
Office Automation	Sept 30-Oct 2, 1985	Phoenix, Arizona	Dataquest Inc	Tlx: 1719773, Ph: (408)-9719000
Computer Indonesia	October 8-12, 1985	Jakarta	Audry Montgomery Group	Tlx: 24591, Ph: (01)-4861951
Semiconductor	October 14-16, 1985	Tucson, Arizona	Dataquest Inc	Tlx: 1719773, Ph: (408)-9719000
Infomatic '85	October 21-24, 1985	Amsterdam	IMC	Tlx: 904100, Ph: (301)-9830604
PerCompAsia '85	October 21-25, 1985	Singapore	Andry Montgomery Group	Tlx: 24591, Ph: (01)-4861951
System '85	Oct 28-Nov 1, 1985	Munich	ECL (Exhibition Agencies)	Ph: (01)-4861951
Computer Storage	Oct 30-Nov 1, 1985	Tucson, Arizona	Dataquest Inc	Tlx: 1719773, Ph: (408)-9719000
CommuniTech & Computer '85	November 18-21, 1985	Kuala Lumpur	Andry Montgomery Group	Tlx: 24591, Ph: (01)-4861951

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ADVERTISERS INDEX

ADVERTISER	PAGE	ADVERTISER	PAGE	ADVERTISER	PAGE
ACI Computer Services	66	Computerland — Bondi Junction	36	Oberoi International	117
Amust Computer Corporation	60 & 61	Computique	96	O'Reilly Computers Pty Ltd	31
Anitech	8, 28	Data Peripherals	155	Optsoft Pty Ltd	68
Apple Computers Aust.	32 & 33	Datacraft	9	Parity Computers	2 & 3
Applied Technology	44 & 45	Discware	106	Peterborough Software	137
Arcom Pacific	67	E. W. Watts & Sons Pty Ltd	76	Qubie	130
Aust. Computer & Telecommunications	156	Epson Computers	142	R & J Distributors	69
Australian Society of Accountants	112, 118	Hartley Computers	134	Regional Television	12 & 13
AWA Computers	57	Hi-Tech Software	51, 152	Scientific Electronics	129
Berespo Computers	124	Highway Safety Development	122	Robs Computer Centre	16 & 17
Brainstorm Computers	39	Hills Computer Services	15	RSI Handbook	83
Brownbuilt Ltd	82	ICL Australia	52 & 53, 55	Sigma Data Corp.	62
Bulleen Prestige Cars	120	Imagineering	103	Software Supplies	21
Businessword Pty Ltd	38	Interface Technology of Aust.	65	Sourceware	94 & 95, 144 & 145
Canon Aust. Pty Ltd	11	International Solutions	34	T & H Hunter Pty Ltd	105
Case Communications	133	Larnet	141	Tallgrass Technologies	19
Compsoft	49	Liebert Corp. Pty Ltd	80	The Bad Back Centre	77
Compucat Pty Ltd	140	Mac Design	64	The Computer Trader	111
Computdata Technology	104	Management Technology Education	22	Trident Computer Services	7
Compumusic	139	Kinetic Systems	70 & 71	Unlimited Computer Solutions	126
Computer Enterprises	151	Nashua	27	Vizden Pty Ltd	72
		Natwick	98	Western Technology	90
		New Dimension Computers Pty Ltd	115	Wordplex	108
				Word Express	84

Flushing out the ferrets

Marmaduke has found a new way to flush 'em out — an electronic ferret, to be precise. Prowling around in bulletin boards lately, your correspondent has turned up a gem on the Tesseract system. It read:

FROM: JOHN LITTLE

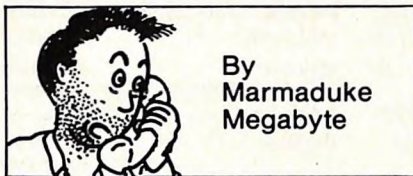
TO: ALL

60 MINUTES would like to speak to any American-style hackers defeating mainframe security. Phone John Little on (02) 438 3433 reverse charges.

When Marmaduke checked, he found it was authentic. He understands that the veritable video avengers have found an 18-year-old hacker from Perth who may be persuaded to tell his tale on the tube. Stand by for lights, camera, legal action.

Marmaduke never has any problems with his own image, but some large computer companies obviously suffer from a case of mistaken identity. Marmaduke had a purr of sympathy for Hewlett-Packard when he got his paws around the following H-P internal memo recently:

"It's becoming increasingly obvious that H-P must give serious consideration to the diversification of its product line. So far our office has had inquiries this year about household thermometers, barometers, vacuum cleaners, FM radios, portable radios, car tape recorders, clippers for grooming dogs, geriatric aids, folding beds, portable commodes and calipers.



"All these, combined with some of last year's inquiries for building materials, dumpy levels, electric jugs, soldering irons and the usual ones about 'do you arrange Hire Purchase (H-P) for people?', would definitely give the impression that we don't sell all the things expected of us."

In the May edition of *Today's Computers*, Marmaduke mentioned two companies that were going public — Datacraft and a Victorian-based microcomputer distributor which has won large NSW Government education contracts. There were enough clues there to identify Barson Computers. The company has since publicly confirmed the Marmaduke murmur, and by the time you read this, it will be listed on the Melbourne and Sydney stock exchanges. It just goes to show that not only does Marmaduke give you first in industry news, but you can make a bit of money on the side.

IBM is coming under increasing pressure to release the JX microcomputer to the Australian public since it has won the title of "preferred system status" with the Victorian Education Department — another Marmaduke tip. IBM's

MD, Brian Finn, recently disclosed to a small gathering that a committee is deciding whether to release the machine publicly. Marmaduke's moolah has it down as a certainty to happen before the end of the year. It just does not make sense that our children learn to use a computer that won't be available to them when they leave school and enter the business world.

While on the IBM JX, the fact that it is as powerful as the PC, and similar to it (but likely to be substantially cheaper), means it will replace the PC in the local marketplace within the next 12 months if available commercially. Although it uses the smaller diskette size, we believe the developer of the original JX (IBM Japan) already has a prototype that uses normal 5¼-inch disks.

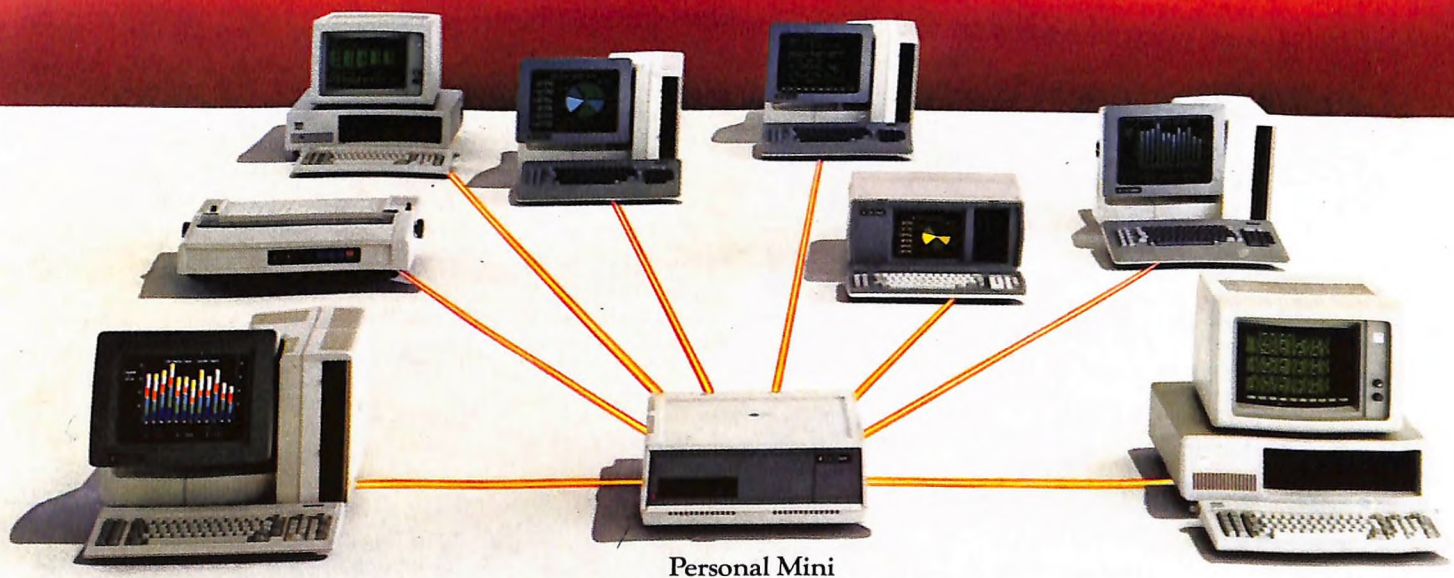
When the dust has settled (and not only the livestock variety), it will be clearly established that the Australian subsidiary of Digital Equipment Corporation is number two in annual turnover in this country.

IBM easily topped the list here when it was recently announced that "Blue" had a turnover of \$663 million. At the conclusion of its financial year, Digital Equipment will announce a turnover of \$175-\$180 million — well ahead of the next in line. Reminds Marmaduke of a song he used to purr: "Don't it make your brown eye blue?" ■



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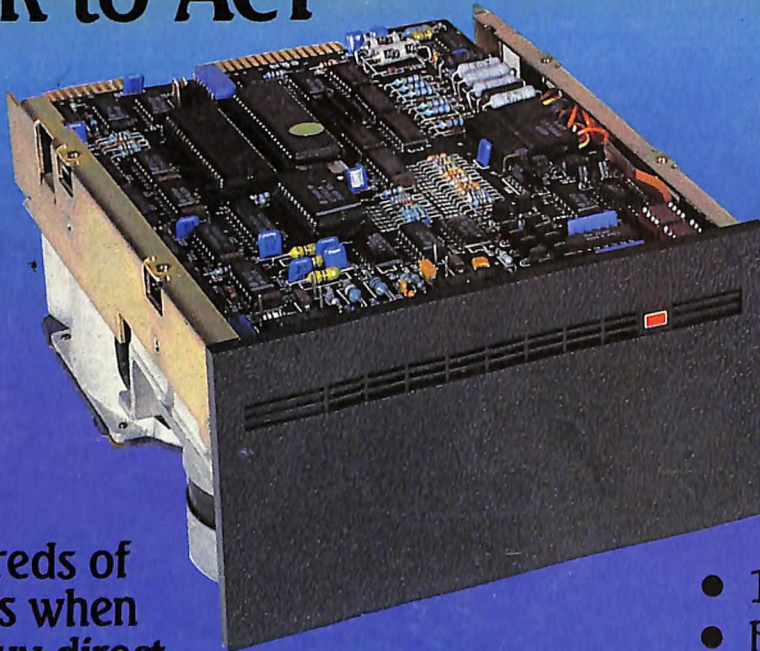
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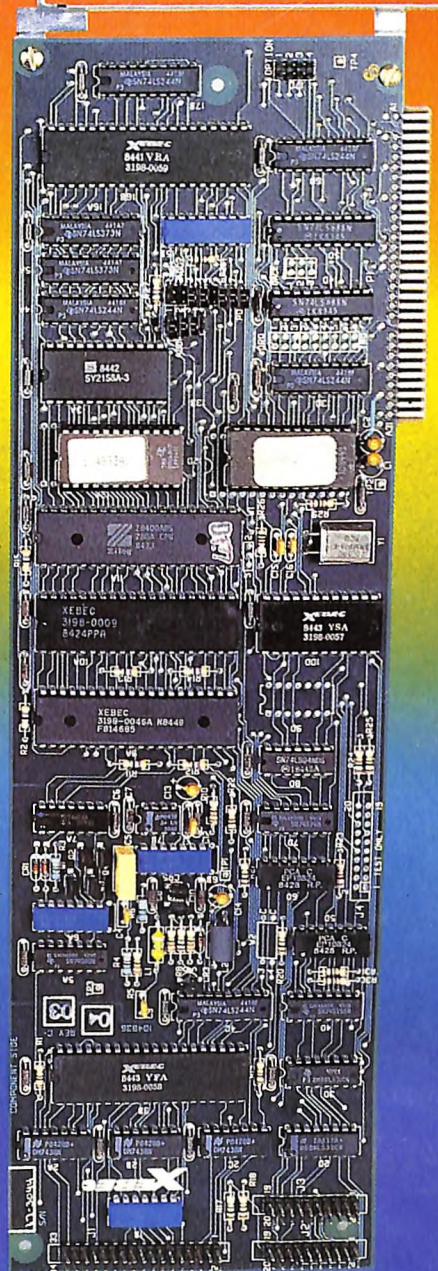
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